Terrestrial Wildlife

Introduction

This section describes the terrestrial wildlife found in the project area and the effects of alternatives. Rather than addressing all wildlife species, discussions focus on Forest Plan management indicator species (MIS), Forest Plan featured species, threatened, endangered, and sensitive (TES) species and landbirds (see individual species lists below). Threatened, endangered, and sensitive species effects are analyzed in more detail in the Easy Fire Recovery Biological Evaluation (Appendix D).

The existing condition is described for each species, group of species, or habitat. Direct, indirect, and cumulative effects of alternatives are identified and discussed.

Regulatory Framework

The two principle laws relevant to wildlife management are the National Forest Management Act of 1976 (NFMA) and the Endangered Species Act of 1973 (ESA). Direction relative to wildlife is as follows:

- NFMA requires the Forest Service to manage fish and wildlife habitat to maintain viable populations of all native and desirable non-native wildlife species and conserve all listed threatened or endangered species populations (36CFR219.19).
- ESA requires Forests to manage for the recovery of threatened and endangered species and the ecosystems upon which they depend. Forests are required to consult with the Fish and Wildlife Service if a proposed activity may affect the population or habitat of a listed species.

Forest Service Manual Direction identifies and prescribes measures to prevent adverse modifications or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species (FSM2670.31 (6)). The Forest Service Manual directs the Regional Forester to identify sensitive species for each National Forest where species viability may be a concern. Forests are required to monitor sensitive species populations and prevent declines that might require listing under ESA (FSM 2670.32 (4)).

Nationwide declines in population trends for the migratory landbirds has developed into an international concern and has led to the creation of an International Partners in Flight (PIF) network and program. In 1992, an Oregon-Washington Chapter of PIF formed, with a separate Oregon subcommittee for assessing conservation needs at the state level. In 1994, the Forest Service, Region 6, signed a Memorandum of Agreement with 14 other agencies and non-agency entities to develop a program for the conservation, management, inventory, and monitoring of neotropical migratory birds.

The principle policy document relevant to wildlife management on the Forest is the 1990 Malheur National Forest Land and Resource Management Plan, referred to as the Forest Plan for the remainder of this section. The Forest Plan provides standards and guidelines for management of wildlife species and habitats. Standards and guidelines are presented at the Forest level (LRMP, pp. IV-26 to IV-33) or Management Area level (LRMP pp. IV-50, IV-53, IV-56 to IV-57, IV-105 to IV-107, and IV-108). Management Areas include General

Forest (MA-1), Rangeland (MA-2), Non-Anadromous Riparian Area (MA-3A, Old Growth (MA-13) and Visual Corridors (MA-14).

The 1995 Regional Forester's Forest Plan Amendment #2 amended Forest Plans for the National Forests in Eastern Oregon and Eastern Washington, including the Malheur National Forest. Amendment # 2 established interim wildlife standards for old growth, old growth connectivity, snags, large down logs, and northern goshawks.

Analysis Method

Effects on wildlife will be assessed for the burned area of National Forest land, focusing on effects of activities within proposed treatment units. The Easy fire has changed approximately 5,839 acres of wildlife habitat and the proposed activities will affect the trajectory of recovery of the burned area. The existing condition is described for each species, group of species, or habitat. Direct, indirect, and cumulative effects of alternatives are identified and discussed.

Although much of the population viability research has concentrated on development of models to ascertain minimum population sizes, risk of extinction and other demographic factors (Ruggiero *et al,* 1994; Boyce 1992; Schaffer 1981), Beissinger and Westphal (1998) support choosing a simple approach that can be supported by data. One such approach is use of historic vegetation structure, composition and function as described in Practical Approaches to the Conservation of Biological Diversity (Baydack et al., 1999). The use of trends in a species habitat as an indirect measure of trends in the species population is known as the "proxy on proxy" approach. The "proxy on proxy" approach operates on the assumption that as long as a species habitat is maintained, the species will likewise be maintained. Therefore, effects on species viability will be determined by assessing how alternatives affect the structure and function of vegetation relative to current historic availability along with available population and habitat status and trend data.

Species populations and distributions are not discussed in depth, as little quantitative data is available for most species. Rather, effects on habitats are discussed, with the assumption that if appropriate habitat is available for a species, then that species occupies or could occupy the habitat. Effects on species will be determined by assessing how alternatives affect the structure and function of vegetation relative to current and historical distributions. The Forest Vegetation section of this document defines the historical patterns and structure within the Malheur National Forest. Field reconnaissance information, pre-fire and post-fire aerial photos, and Geographic Information System databases provided additional information.

Species population densities and diversity information for the different species reviewed in this analysis were not available due to lack of surveys. Inferences regarding species diversity and relative population levels were made based upon habitat quality, condition and quantity. Habitat information outside of the fire area was limited to satellite imagery data that has inconsistencies at the site specific stand scale. Field walk-throughs, aerial photo interpretation, digital ortho-quad data and review of limited GIS habitat data was used to characterize and describe habitat features outside the fire area. Site-specific snag data was lacking in most of the fire area. Photo interpretation data validated by stand exams was the primary data used to estimate snag densities and distribution. Where available, cruise plot data was also utilized to determine general levels of snag densitites and distribution across different diameter classes. Walk throughs, post fire aerial photo and limited GIS data were also used to make inferences on snag density, distribution and size classification for the fire area. Likewise, down wood information was also limited. Similar inferences were made to analyze affects to down wood habitats. Where needed and applicable, professional judgement, supported by limited information that was available, was used to assess habitat conditions and quality.

The survival of fire-damaged trees is determined by various factors including but not limited to age, size, fire-resistance characteristics of the affected tree species, stand density, fuel loads, and season of fire; and site characteristics that influence the intensity and duration of the fire, and degree of damage to trees. Trees that show limited to no crown or bole scorch can succumb to the damage caused by fire up to 5 years after the fire, appearing live and healthy at first and slowly declining (D. Scott, pers. com.). Consequently it may be several years until the complete extent of the tree mortality in the fire area will be known. Attempts have been made to develop guidelines for determining the probability of the survival of trees affected by fire (Scott et al., 2002). A rating system developed by D. Scott and others (2002) with the Blue Mountain Pest Management Service Center is being used in the Easy fire area to rate the probability of survival of those trees in proposed harvest units that appear to have survived the fire.

The existing condition section for each wildlife species or group of species describes conditions expected after all trees expected to die have lost their green needles. Although trees may still provide cover or canopy habitat today, the condition is expected to be short-lived, only up to 5 years, even under the No Action Alternative. Projecting existing conditions to year 5 better reflects the expected habitat conditions and provides a more realistic way to compare alternatives. This approach applies the short-term definition (2-10 years) described in Chapter 1.   Additionally, the needles and smaller branches will drop to the ground increasing the loading of fine fuels on the forest floor. These fine fuels would help carry fire through the stand and helping ignite larger fuels potentially increasing the risk and severity of a reburn.

Some wildlife habitats require a detailed analysis and discussion to determine potential effects on particular species. Other elements may either not be impacted or are impacted at a level which does not influence the species or their occurrence. The level of analysis depends on the existing habitat conditions, the magnitude and intensity of the proposed actions, and the risk to the resources.

Rather than addressing all wildlife species, the Forest Plan focuses on three categories of wildlife: management indicator species (MIS), featured species, and threatened, endangered and sensitive (TES) species. In addition, interest has been raised for neotropical migratory birds. Categories and wildlife species are summarized below:

Management Indicator Species (MIS)

The Malheur Forest Plan, as amended, identifies 15 Management Indicator Species (MIS) and their associated habitat requirements. MIS habitat requirements are presumed to represent those of a larger group of wildlife species, and act as a barometer for the health of their various habitats. Pine marten, pileated woodpecker, and northern three-toed woodpecker represent old growth habitats, Rocky Mountain elk represent big game species, and primary cavity excavators (most woodpeckers) represent dead wood habitats. For a full listing of Management Indicator Species see the “Existing Condition sections for Big Game, Primary Cavity Excavators, and Old-Growth.

Featured Species

The Malheur Forest Plan defines a featured species as a wildlife species of high public interest or demand. The featured species associated with the project area are northern goshawk, blue grouse, and antelope. Effects to northern goshawk and blue grouse will be discussed in the Featured Species – Northern Goshawk and the Featured Species – Blue Grouse sections, respectively. Effects to antelope will be discussed as part of the Big Game Habitat Section.

Threatened, Endangered and Sensitive Species

An endangered species is an animal or plant species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range. A threatened species is an animal or plant species listed under the Endangered Species Act that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. A sensitive species is an animal or plant species identified by the Forest Service Regional Forester for which species viability is a concern either a) because of significant current or predicted downward trend in population numbers or density, or b) because of significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution. Threatened, endangered, and sensitive species effects are analyzed in the Easy Fire Recovery Biological Evaluation for Wildlife Species (Appendix D).

Landbirds Including Neotropical Migratory Birds

Landbirds, including neotropical migratory birds, are discussed because many species are experiencing downward population trends. Based on a review of the District's wildlife database and observations made during reconnaissance of the fire area, there is a high confidence level that species discussed in this report are either currently present in the area or were prior to the fire.

Landbirds, including Neotropical migratory birds (NTMB), were analyzed based on high priority habitats identified in the Oregon-Washington Chapter of Partners in Flight, Northern Rocky Mountains Bird Conservation Plan (Altman 2000). While the Forest has not conducted official NTMB surveys in the project area, the Oregon Breeding Bird Atlas (Adamus et al. 2001) includes observational data for this area. Many of the avian species/habitats identified in the Northern Rocky Mountains Bird Conservation Plan (Altman, 2000), are also addressed in the USFWS's Birds of Conservation Concern (USFWS, 2002). Local biologists and ornithologists provided much of the data for the Malheur National Forest. Most NTMB species that are expected in the project area were recorded within the hexagons. Based on a review of the District's wildlife database and observations made during reconnaissance of the fire area, there is a high confidence level that species discussed in this report are either currently present in the area or were prior to the fire.

Old-Growth

Old-growth habitat was analyzed through fire area reconnaissance, the District's old- growth map layer, Dedicated and Replacement Old-Growth surveys, and post-fire structural stage determinations made by the project silviculturist. Because the Easy fire damaged several Dedicated and Replacement Old-Growth areas (MA-13), opportunities to relocate these management areas were considered in unburned areas outside the fire area.

Elk

Elk habitat was evaluated using the Habitat Effectiveness Index (HEI) (Thomas et al. 1988), marginal and satisfactory cover percentages, and open road densities. Cover acres were estimated using 2002 aerial photo interpretation data; cover percentages were reduced to reflect losses due to the fire. Open road densities were calculated using the District access travel management database. Values were estimated for National Forest lands at the subwatershed level. The large expanses of private land to the west of the project area were not included in calculations, although they were considered in cumulative effects discussion.

Snags and Down Wood

Snag densities were estimated using data obtained through 2000 photo interpretive data validated by stand exams and cruise plots to obtain a pre-fire stand condition. The data was then manipulated using assumptions based on fires consumption of down wood and snags, and expected mortality relative to fire vegetation severity. Snag densities were estimated at the project area level and at the treatment unit level. This analysis uses DecAID (Mellen et al. 2003) to evaluate alternative effects on snags. DecAID is an internet-based computer program being developed as an advisory tool to help federal land managers evaluate effects of management activities on wildlife species that use dead wood habitats. The tool synthesizes published literature, research data, wildlife databases, and expert judgment and experience.

Cumulative effects were first analyzed within the context of the project area, i.e., the burn area. If there were no contributions to negative or positive cumulative effects at that scale, then further analysis was not conducted. If there were contributions to effects at that scale, then the scale was broadened to a larger land base scale, usually the subwatershed level.

The No Action Alternative is required by NEPA. For the purposes of this specialist report, No Action Alternative means the proposed project (which includes all activities identified in the proposed action) would not take place in the Easy analysis area at this time. Alternative 1 is designed to represent the existing condition. It serves as a baseline to compare and describe the differences and effects between taking no action and implementing Action Alternatives.

The No Action Alternative is used as a benchmark to compare and describe the differences and effects between taking no action and implementing Action Alternatives. The No Action Alternative is designed to represent the existing condition; resource conditions are then projected forward in time to estimate resource changes expected in the absence of the proposed management activities. However, if the No Action Alternative is chosen, the Forest Service still maintains the discretion to adjust Dedicated and Replacement Old Growth areas (MA-13), plant trees, and close roads by conducting separate environmental analyses.

Existing Condition - Old-Growth

Dedicated and Replacement Old Growth

Region 6 developed a network of designated habitat areas to provide blocks of old growth coniferous forest across the landscape designed to support old growth management indicator species populations and allow for dispersal of individuals. These are known as Dedicated Old Growth (DOG) areas and Replacement Old Growth (ROG) areas. Replacement areas may not have all the characteristics of old growth, but are managed to achieve those characteristics so that when a Dedicated Old Growth area no longer meets the needed habitat requirements, the replacement old growth area can take its place.

On the Malheur National Forest, these old growth blocks were designed to provide the necessary network of habitat areas for pileated woodpecker and pine marten. Although these old growth areas are managed specifically for these two species, the Forest Plan assumes the old growth network will provide habitat for many other old growth associated species as well.

In addition, the three-toed woodpecker is identified as a management indicator species for old growth lodgepole; however, habitat on the Malheur is quite limited and few old growth areas have been formally designated.

Pileated Woodpecker

Pileated woodpecker prefer mature and old growth forests with at least 60% canopy cover (Bull & Holthausen, 1993). This species relies heavily on snags and downed wood material for foraging. Nests are built in cavities excavated in large (> 21 inches DBH) dead or decadent ponderosa pine, western larch or grand fir trees. Pileated woodpeckers are not strongly associated with post-fire habitats; individuals may use a burned area for foraging, but are not expected to nest there (Bull & Holthausen, 1993).

Habitat trend information derived from Interior Columbia Basin studies (Wisdom et al. 2000) indicated that about 60% of the watersheds in the Blue Mountains showed a decreasing trend in pileated woodpecker habitat and 30% showed an increasing trend. Declines in source habitat are primarily attributed to a reduction in late seral forest. Breeding Bird Survey (BBS) data indicated a 7.8% annual decline in populations in Oregon and Washington from 1966 through 1994 (Wisdom et al. 2000).

The Forest Plan directs that pileated woodpecker Dedicated Old Growth (DOG) areas are to be at least 300 acres of mature and old growth habitat; Replacement Old Growth (ROG) areas are intended to be half the size of the DOG, i.e., about 150 acres. Pileated woodpecker DOGs were delineated Forest-wide to provide an even distribution of habitat areas, one DOG every 12,000 acres, or approximately 5 miles apart. Management requirements were derived from the U.S. Forest Service 1986 Minimum Management Requirements.

A portion (75ac) of Pileated/Pine Marten Feeding Area 365 is within the perimeter of the fire area. Though this area burned with moderate vegetation severity, its functionality as a feeding area for pileated woodpeckers has only been impacted to a minor degree. The fire created more snags in the area, increasing its usefulness. The amount of down wood, however, was reduced by the fire. The reduced down wood may have reduced its usefulness slightly for the short term. As older snags in the area begin to fall the down wood levels will increase, improving the usefulness of the area for pileated woodpeckers.

Pine Marten

Pine martens prefer mature old growth forest with a well-developed canopy. Martens show a strong avoidance of open areas, probably as a response to predator avoidance (Hawley & Newbry, 1957). Cover and prey species largely determine their distribution and abundance. Snags and downed woody material are important for winter and summer dens, resting sites, and cover for prey species. Strickland and Douglas (1987) found that marten did not use recent burns because habitat changes reduced prey populations and overhead cover. Avoidance persisted for as long as 23 years post-disturbance, generally until regenerated forests provided overhead cover.

Habitat trend information derived from Interior Columbia Basin studies (Wisdom et al. 2000) indicated that about 50% of the watersheds in the Blue Mountains showed a decreasing trend in marten habitat and 35% showed an increasing trend. The distribution of marten within the Interior Columbia Basin has been fairly stable, but population changes are not known (Wisdom et al. 2000).

The Forest Plan directs that pine marten DOGs are to be 160 acres and ROGs are to be 80 acres. Pine marten DOGs were delineated every 4,000 to 5,000 acres, or approximately 3 miles apart. (Management requirements were derived from the US Forest Service 1986 Minimum Management Requirements.)

Northern Three-Toed Woodpecker

There are no designated habitat areas for northern three-toed woodpecker in the project area. This species is also a management indicator species for dead and defective habitat; Existing Condition for this species is discussed in the section below on Primary Cavity Excavator Species.

Habitat trend information derived from Interior Columbia Basin studies (Wisdom et al. 2000) indicated that about 70% of the watersheds in the Blue Mountains showed an increasing trend in three-toed woodpecker habitat and 30% showed a decreasing trend. Breeding Bird Survey (BBS) data is insufficient to determine population trends in the Interior Columbia Basin, but data summarized across the West indicates a 0.7% annual decline in populations from 1966 through 1994 (Wisdom et al. 2000).

Old Growth Forest Within the Project Area

DOG and ROG 364 are located within the burn area (see Figure 9, Map Section). Prior to the fire, DOG/ROG 364 contributed towards pileated woodpecker and pine marten management requirements.

The fire burned through both old growth areas; fire intensities ranged from moderate intensity or mosaic burns to severe intensity or total burns. There were several small areas that were unburned. Table TW-1 below identifies the DOGs and ROGs within the project area, subwatersheds, total acres, total acres burned, and post-fire structural stage.

Table TW-1: Dedicated and Replacement Old Growth Areas Burned

Old Growth Area	MIS Species	Subwatershed	Total Acres Burned	Acres Burned by Mortality Class	Post-fire Structural Stages
DOG 364	Pileated Woodpecker Pine Marten	Clear Creek	393	Severe – 264 Moderate – 130 Low - 0 Unburned - 0	SI, UR
ROG 364	Pileated Woodpecker, Pine Marten	Clear Creek	237	Severe – 33 Moderate – 185 Low - 9 Unburned - 10	SI, UR

DOG = Dedicated Old Growth, ROG = Replacement Old Growth
MIS = Management Indicator Species
Tree Mortality Classes:
Severe Mortality (total burn)
Moderate Mortality (mosaic burn)
Low Mortality (underburn)
SI = Stand Initiation; UR = Understory Re-initiation

Post-fire, there is essentially no mature or old growth habitat remaining that meets pileated woodpecker, pine marten or three-toed woodpecker habitat requirements based on the current Forest Plan guidelines. The Dedicated and Replacement Old Growth areas are no longer functioning as old growth. Stands have been converted to understory re-initiation (UR) and stand initiation (SI) structural stages. Canopy cover has been reduced below 20% and in many places eliminated all together. Snags resulting from the fire will provide nesting and foraging habitat for northern three-toed woodpeckers.

The fire also destroyed old growth habitat outside of the Dedicated and Replacement Old Growth areas. Post-fire, there are no (0) acres of old growth remaining (see Forest Vegetation Section). What little old growth habitat remains is small and highly fragmented, and although vegetation conditions may classify these areas as old growth, they likely provide for few old-growth dependent species. These old growth conditions may be important as legacy structures in future stands.

Old Growth Connectivity

Connectivity refers to the habitat between old growth areas that allows species to move between these areas. Regional Forester's Forest Plan Amendment 2 (1994) requires that connectivity corridors be established between late and old structure stands. Stands should commonly have medium diameter or larger trees (≥9 inches DBH), and canopy closure should be within the top 1/3 of site potential. Corridors should be at least 400 feet wide. If appropriate stands are not available, then the next best stands will have to provide connectivity, and should be managed to improve connectivity.

Post-fire connectivity habitat is best evaluated by viewing the Vegetation Severity map (see Figure 6, Map Section). Before the fire two connectivity corridors ran through the Easy Fire area. One corridor ran along the top of the ridge between Mossy Gulch and Clear Creek. The other is the riparian area along Clear Creek. The ridge top corridor mostly burned with high severity eliminating it's usefulness in providing connectivity. The corridor along Clear Creek is relatively intact. The fire burned through the riparian area in a couple of locations causing small gaps in the corridor. Approximately 51% (3002 acres) of the fire area burned with high severity, mostly in the central section of the area. Severe tree mortality areas do not provide connectivity. Connectivity between old growth stands through the fire area is now highly limited.

Environmental Consequences - Old Growth

The Forest Vegetation Section, Stand Structural Stages, of this DEIS projects old growth development in the burn area under all the Alternative scenarios (see Forest Vegetation Section).

Direct and Indirect Effects - No Action

There would be no direct effects to old growth habitats within the project area. The fire has essentially eliminated all old growth from the burn area. Some small islands of old growth survived the fire. However, they are not large enough to provide a home range for pileated woodpeckers but could provide some limited foraging opportunities. Habitat effectiveness for old growth species would remain as described in the existing condition. The No Action alternative would have no immediate effects on pine marten, pileated woodpeckers, or their habitats. Research has shown that martens are unlikely to be present in burned areas for 20 or more years post-fire (Strickland & Douglas 1987). Pileated woodpeckers are not strongly associated with post-fire habitats; individuals may use a burned area for foraging, but are not expected to nest there (Bull & Holthausen, 1993).

The No Action Alternative would not designate any new Dedicated Old Growth areas to replace those lost in the fire, creating gaps in the old growth network. Existing DOGs and ROGs would not meet Forest Plan standards for designated habitats, and there would be a net reduction (630 acres) in suitable habitat for pileated woodpecker and pine marten under the MA-13 designation.

In 50 years old growth would develop from the stem exclusion open canopy and closed canopy stands (SEOC and SECC), and the YFMS that were lightly burned by the fire, and consequently retained many medium–sized live trees. In the moderately to severely burned areas, old growth development is highly dependent on regeneration success. Under a natural regeneration scenario, it is expected that it will take newly regenerated stands 150 to 200 years to establish old growth structure.

Stands will develop into either old forest single stratum (OFSS) or old forest multiple strata (OFMS) depending on site-specific conditions including biophysical environment, amount and rate of natural regeneration, and future management activities. It is expected that the landscape will include a mosaic of both old growth types. OFSS would favor such species as white-headed woodpecker and flammulated owl and OFMS would favor cover-dependent species such as pileated woodpecker, pine marten and northern goshawk.

The No Action Alternative would maintain existing connectivity. Although dead tree boles might provide a small amount of cover, the use of burn areas for connectivity is very limited. Light mortality or underburn areas and non-burn areas (16% of the forested areas) are currently providing little connectivity in the area (see Figure 6, Map Section). The lightly burned and unburned areas are scattered throughout the fire area. In moderately and severely burned areas (84% of the forested areas), connectivity habitat for species that rely on ground cover, such as pine marten, could be reestablished once snags have fallen and live trees have been reestablished. Because the No Action Alternative relies on natural regeneration to reforest burned areas, recovery of this minimal level of cover could take 35 to 65 years. Although these stands may provide connectivity habitat as early as year 35 for some animals, it should be noted that conditions would still not meet connectivity definitions as defined by the 1994 Regional Forester's Plan Amendment #2. Moderately and severely burned areas could take 60 to 90 years to develop into connectivity habitat as defined in Amendment #2.

The risk of an intense reburn is high with this alternative, although risks do not increase for 10 to 20 years, the time it is expected for most snags to fall to the ground and elevate fuel loads beyond risk thresholds. Development of OFSS and OFMS would be further delayed if another stand replacement fire were to occur.

Direct and Indirect Effects - Alternatives 2,3,4, and 5

Alternatives 2, 3, 4, and 5 would designate new old growth areas to replace those lost to the fire (see Figure 9, Map Section for original and new locations). The relocation of Dedicated Old Growth (DOGs) and Replacement Old Growth (ROGs) should maintain the integrity of the Forest's old growth network.

Under alternatives 2, 3, 4, and 5, Dedicated and Replacement Old Growth 364 will be relocated outside the fire perimeter. The DOG and ROG burned with moderate to severe mortality of trees; few live trees remain. No other OFMS or OFSS survived the fire in sufficient amounts to comprise a new DOG and ROG within the fire perimeter. The new locations provide better opportunities to manage for old growth given the level of fire damage in the original location. Acres in the new DOG/ROGs would be converted from general forest (MA-1) to Dedicated Old Growth (MA-13). Conversely, existing DOG/ROG 364 within the fire perimeter would be converted from MA-13 to MA-1. A nonsignificant Forest Plan amendment would be required to relocate DOG/ROG 364 and change Management Area (MA) designations.

The new DOG will be located on the west slope of Mossy Gulch in the Reynolds Creek subwatershed adjacent to the western perimeter of the fire area; approximately 2 miles to the southwest. The stand that comprises the new DOG meets the definition of a DOG; there are an average of 10 snags per acre >21"and an average of 17 green trees per acre >21". The stand is multi storied with several age classes represented. The stand is currently being used by pileated woodpeckers at this time (pers.obs., pers. comm.). This new DOG comprises 393 acres of OFMS and replaces the 393 acres of the old DOG.

The new ROG is located on the south slope of North Reynolds Creek in the Reynolds Creek subwatershed about 0.5 miles south of the southern perimeter of the fire area and 3.25 miles to the south southwest of the old ROG. This new ROG contains 547 acres and replaces the 237 acres of the old ROG. The new ROG is larger than the old ROG so that it can provide a connection between the connectivity corridor that follows Clear Creek and went through the center of the fire area and the corridor to the west of the fire. This will allow for wildlife movement around the fire area.

Table TW-2 summarizes changes to Dedicated and Replacement Old Growth Area Designations by Alternative.

Table TW-2: Dedicated and Replacement Old Growth Areas Burned

Old Growth Area	MIS Species	Subwatershed	Alternative 1	Alternatives 2, 3, 4, and 5	
			Acres	Acres	Comments
DOG 364 (pre-fire)	Pileated Woodpecker, Pine Marten	Clear Creek	393	0	DOG relocated to Reynolds subwatershed. Converted from MA-13 to MA-1.
ROG 364 (pre-fire)	Pileated Woodpecker, Pine Marten	Clear Creek	237	0	ROG relocated to Reynolds subwatershed. Converted from MA-13 to MA-1.
New DOG 364	Pileated Woodpecker, Pine Marten	Reynolds Creek	0	393	Converted from MA-1 to MA-13.
New ROG 364	Pileated Woodpecker, Pine Marten	Reynolds Creek	0	547	Converted from MA-1 to MA-13.
TOTAL			630	940	

DOG = Dedicated Old Growth, ROG = Replacement Old Growth
MIS = Management Indicator Species
MA-13 = Management Area for Old Growth:
MA-1 = Management Area for General Forest

Salvage harvest and fuels reduction would not affect mature or old growth habitat in the short-term. Salvage harvest would not occur under Alternative 5. Burned areas are no longer functioning as old growth habitat and are not likely to be used by pileated woodpecker for nesting or by pine marten for denning before forest cover is reestablished. These species may use dead wood habitats for foraging substrate, but neither has a strong association with post-burn habitats. In all alternatives, snag and woody debris guidelines would maintain habitat components for foraging (see the Primary Cavity Excavator section for additional information on foraging habitat).

A portion (75ac) of Pileated/Pine Marten Feeding Area 365 is within the perimeter of the fire area. Though this area burned with moderate vegetation severity, its functionality as a feeding area for pileated woodpeckers has been only impacted to a minor degree. The fire created more snags in the area, increasing its usefulness. The amount of down wood, however, was reduced by the fire. The reduced down wood may have reduced its usefulness slightly for the short term. As older snags in the area begin to fall the down wood levels will increase, improving the usefulness of the area for pileated woodpeckers. No harvest is planned within this Pileated/Pine Marten Feeding Area in any of the Action Alternatives.

Habitat within new ROG 364 does not yet function as old growth, but will be managed to provide old growth in the future; no adverse effects to pileated woodpecker nesting habitat or pine marten denning habitat is expected.

In 50 years old growth will develop from stem exclusion open canopy stands (SEOC) that were lightly burned by the fire, and consequently retained many medium–sized live trees.

Planting proposed in alternatives 2, 3, and 4 would reforest moderately and severely burned areas more quickly than if no action was taken and natural regeneration was required to reforest the area (see Forest Vegetation Section). Alternative 5 would plant only severely burned areas. Old growth development would be accelerated. The disparity in planting trees versus natural regeneration does not become readily apparent until around 100 years when late successional and mature stands (YFSS, YFMS, OFMS, OFSS) could comprise 100% of the area under the action alternatives. By year 150, 100% of the stands could be OFSS or OFMS versus the no action alternative, which would take 200 years to move all of these areas into the OFSS/OFMS stage.

The only remaining connectivity corridor is the RHCA along Clear Creek. No salvage activities are planned in this RHCA. The only trees felled will be to facilitate logging operations, reduce safety hazards, or used for in-channel wood. Trees felled for those purposes will be left on site. Therefore, alternatives 2, 3, 4, and 5 would maintain this existing connectivity. Although standing dead trees might provide a small amount of cover, the use of burn areas for connectivity is very limited.

Future connectivity habitat would develop as described in Alternative 1 except that tree planting would accelerate habitat recovery. Marten would likely first return to sites where vegetation cover has recovered and an abundance of downed logs have accumulated; e.g., non-harvested riparian areas. Alternative 3 forgoes salvage harvest on an additional 832 acres over Alternative 2; increasing acres which may eventually provide the preferred combination of vegetation and down logs. Alternative 4 forgoes salvage harvest on another 301 acres above Alternative 3 and 1,133 acres less than Alternative 2, and therefore, would generate favorable conditions on the most acres with the exception of the No Action Alternative. Due to the spatial arrangement of the moderately to severely burned areas on the landscape (see vegetation severity map, Figure 6, Map Section) development of connectivity will occur more quickly with Alternatives 2, 3, 4, and 5 than with the No Action Alternative. A large portion of the connectivity corridor that ran through the middle of the fire area was burned severely with close to 100% mortality. Alternatives 2, 3, and 4 would replant the salvage harvested areas and would give those areas a 20 – 50 year headstart over the No Action Alternative which would rely on natural regeneration. Alternative 5 would plant only those acres that are severely burned. Restoration of connectivity habitat as defined by the 1994 Regional Forester's Plan Amendment #2 could take 100 years to develop as compared to 120 to 150 years under the No Action alternative.

Under Alternative 4, the elevated fuel loads expected in 10 to 20 years increase the risk of an intense re-burn; another stand replacement fire could further delay development of old growth. Alternatives 2 and 3 also leave some burn areas untreated. Salvage logging and fuels reductions reduce overall fuel loads and break up the continuity of fuels remaining. Development of OFSS and OFMS would be further delayed if another stand replacement fire were to occur.

Cumulative Effects

All of the activities listed in "Past, Present, and Reasonably Foreseeable Actions" (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on old growth and associated species. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Since 1993, the Forest Plan as amended, has directed the Malheur National Forest to conduct timber sales in a manner that moves stands towards OFMS and OFSS structural stages, and timber sales planned since that time should not have contributed to loss of mature and old growth forest. Future timber management activities have yet to be proposed for the unburned areas of the affected subwatersheds, any management activities would be expected to continue under current or similar direction.

The Crawford Vegetation Management Project proposes several types of vegetation management in the vicinity of Crawford Creek. This project is located approximately 4.5 air miles to the north northeast and is within the Upper Middle Fork John Day watershed. It can be assumed that any vegetation modification will comply with the Malheur Forest Plan.

In burned riparian areas, hardwood and conifer planting is being planned under separate NEPA documents; conifer planting will help accelerate development of old growth.

Alternative 1 would result in a loss of dedicated old growth habitat. This alternative would not replace the dedicated and replacement old growth that was lost due to the fire. The result will be a decrease in the amount of dedicated and replacement old growth in the watershed and the DOG/ROG network for the next 50-200 years, the time it would take for the burned DOG and ROG to reattain old growth characteristics.

In the short-term, alternatives 2, 3, and 4 would not contribute to cumulative losses of mature and old growth habitat because stands treated no longer function as old growth. In the long-term, alternatives 2, 3, and 4 would contribute positively to cumulative effects by accelerating the development of old growth, and therefore, contribute positively toward the viability of species that use these habitats.

Alternatives 2,3,4, and 5 would replace the fire damaged DOG and ROG with a new DOG and ROG. Replacing the old DOG and ROG will maintain the amount of dedicated and replacement old growth in the DOG/ROG network. The amount of dedicated and replacement old growth in the Upper Middle Fork John Day would decrease while the Upper John Day watershed will show an increase.

Old-Growth Summary

Salvage harvest and fuels reduction would not affect mature or old growth habitat in the short-term. Burned areas are no longer functioning as old growth. Pileated woodpeckers and pine martens are not strongly associated with post-burn habitats. In all alternatives, snag and woody debris guidelines would maintain habitat components for foraging; the amount of dead wood habitat retained varies by alternative (see the Primary Cavity Excavator section for additional information on dead wood habitat).

Planting proposed in alternatives 2, 3, and 4 would reforest moderately and severely burned areas more quickly than if no action was taken and natural regeneration was required to reforest the area. Alternative 5 plants only the severely burned areas; so less of the fire area will be attaining an old growth condition sooner than in alternatives 2, 3, and 4. In the moderately to severely burned areas, old growth habitat could be recovered in 150 years versus 170 to 200 years under the No Action Alternative.

The No Action Alternative would not designate any new Dedicated Old Growth stands to replace those lost in the fire, creating gaps in the old growth network. Conversely, alternatives 2, 3, 4, and 5 would designate new old growth areas to replace those lost in the fire.

Under Alternative 1 the elevated fuel loads expected in 10 to 20 years increase the risk of an intense re-burn; another stand replacement fire could further delay development of old growth. Alternatives 2, 3, 4, and 5 also leave some burn areas untreated, but salvage logging and fuels reductions reduce overall fuel loads and break up the continuity of fuels remaining.

There are no significant direct, indirect or cumulative effects to pileated woodpeckers or pine martens or their habitat from any of the alternatives.

Existing Condition - Big Game Habitat

Rocky Mountain elk, mule deer and antelope are the big game species of concern due to their high public value. The project area is entirely within big-game summer range. These species are considered widely distributed across the District, Forest and the Blue Mountain Region. Rocky Mountain elk are identified in the Forest Plan as a management indicator species (MIS); habitat quality is evaluated in terms of forest cover, forage quality, and open road density. Antelope are identified in the Forest Plan as a featured species dependent on open landscapes.

Two habitat components, thermal/hiding cover and forage, have been significantly reduced as a result of the fire. Many animals probably have dispersed into the unburned portions of the Clear, Bridge, and Reynolds subwatersheds as well as other adjacent subwatersheds. Loss of habitat may concentrate more animals into adjacent areas, forcing increased competition for cover and forage. Loss of habitat has likely affected big game distribution and use, rather than actual population numbers.

Antelope primarily use open landscapes. Most of their habitat is on private property to the west and southwest of the fire area. It is unlikely that antelope utilized the fire area prior to the fire due to the forested condition that existed before the fire. Forest edges provide fawning habitat. Although the fire opened up landscapes, the high density of standing dead trees combined with an initial deficiency in forage probably still precludes much use. The fire has probably had minimal impact on antelope populations and distribution because there really is no change in the current habitat situation for this species.

Thomas et, al. (1988), developed the Habitat Effectiveness Index (HEI) model for estimating elk habitat effectiveness on the landscape. Overall habitat effectiveness (HEscr) incorporates three variables or indices for summer range: cover quality (HEc), size and spacing of cover (HEs) and open road density (HEr). The Forest Plan establishes minimum standards for these indices. In addition, the Forest Plan establishes minimum standards for retention of satisfactory cover (%S), marginal cover (%M), total cover (%S and M), and open road density (see Table TW-3).

Table TW-3 displays existing HEI values, cover percentages, and open road densities for each subwatershed affected by the fire.

Table TW-3: Existing HEI Values, Cover Percentages and Open Road Densities by Subwatershed.

Subwatershed	HEc	HEs	HEr	HEcsr (HEI)	%S	%M	Total Cover %	Open Road Density (miles per square mile)*
Forest Plan Standard	.30	.30	.40	.40	12%	5%	20%	3.2
Bridge Creek	0.65	0.73	0.32	0.54	17%	40%	57%	3.7
Clear Creek	0.63	0.66	0.28	0.49	12%	32%	44%	4.2
Reynolds Creek	0.78	0.54	0.40	0.55	24%	19%	43%	2.9

HEI = Habitat Effectiveness Index

HEc = habitat effectiveness derived from the quality of cover

HEs = habitat effectiveness derived from the size and spacing of cover

HEr = habitat effectiveness derived from the density or roads open to vehicular traffic

%S = Satisfactory Cover

%M = Marginal Cover

% Total Cover = %S + %M

*Open road densities in this table do not reflect seasonal closures. These closures would temporarily reduce open road density and increase HEr and HEI values.

Forage

Elk and deer are already using the burn area (pers. obs.); post-burn forage is limited, but the new sprouts are nutrient-rich and highly palatable. Forage is expected to recover rapidly. Improved forage may increase big game reproductive rates and subsequently, increase populations. The effect of the fire on size and spacing of forage areas is and will continue to affect how elk and deer use the burned areas. The moderately and severely burned areas that occur in large blocks, such as the central portion of the fire area will only get partial use for foraging due to the lack of nearby cover. Deer and elk most heavily utilize the portions of forage areas that are within 183m of cover (Thomas et. al, 1979). The large open areas (>30 acres) will only get use within 183m of cover. The remainder of the area will essentially be unused.

Cover

Little marginal or satisfactory cover remains within the fire perimeter. Some smaller patches exist where the fire burned at low severity, but few stands meet the minimum 40% canopy closure or the 10- to 30-acre patch size standards established in the Forest Plan. Deer and elk are believed to use thermal cover to reduce the effects of weather and temperature extremes and to hide from predators. Hiding cover varies depending on understory vegetation, and topography. Shrubs and saplings in the understory provide the most cover. Tree boles provide minimal hiding cover except where they are in high densities. The understory was essentially eliminated in the majority of the areas that burned moderately and all of the areas that burned severely.

It is important to note that recent research on the Starkey Project in La Grande, Oregon (Cook, 1998) has raised concern that resource managers may be overstating the importance of thermal cover on elk condition. Studies suggest that the energetic benefits of thermal cover may be inconsequential to elk performance. But, that it is forage and it's nutritional effects that may have the greater impact on individual animal performance. However, these studies do not dispute elk's preference for dense forest stands or the numerous studies that show elk using dense stands disproportionately to their availability. Dense conifer cover contributes to better distribution of elk across available habitat, and may be more of a disturbance/hiding cover issue than a thermal regulation issue.

Post-fire, very little hiding cover exists within the fire perimeter. Hiding cover provides a visual barrier between big game animals and disturbance sources. This is especially important during hunting season when big game animals alter their travel patterns to avoid humans. Dead tree boles might offer some security, but only where snag densities are high, and even then it is of limited value compared to a similar live, green tree situation.

The fire area likely provided little fawning habitat prior to the fire. Snow likely persists in the area beyond the fawning season. The riparian areas associated with Clear Creek and it's tributaries would provide potential fawning habitat in low snowfall years. The Clear Creek riparian area was largely unaffected by the fire, however the proximity of Clear Creek Road would likely discourage the use of the area for fawning.

Oregon Department of Fish and Wildlife (D. Bruning, ODFW Wildlife Biologist, personal communication September 2, 2004) concluded that the Easy Fire, at 5,800 acres could affect big game use and distribution, but was unlikely large enough to affect population numbers. Of greater concern would be harvest and planting activities that resulted in a homogenous monoculture future forest. Silvicultural prescriptions for harvest units and planned planting of a mix of species that is representative of pre-fire conditions will not result in a homogenous monoculture future forest. Although the fire greatly reduced security cover, the surrounding unburned areas provide sufficient cover to meet habitat needs. Elk and deer will likely forage in the burn area, primarily during the night, and retreat to security areas during the day. During the hunting season, elevated human use and hunting pressure in the cover-deficient burn area will likely force animals into adjacent unburned areas.

Roads

The Clear Creek and Bridge Creek subwatersheds do not meet Forest Plan standards for open road density; the Reynolds Creek subwatershed meets the Forest Plan standard (see Table TW-3). Research has shown that higher open road densities reduce habitat effectiveness for deer and elk (Thomas et. al, 1979). Following the fire, all roads have been temporarily closed to public access. Once hazard trees along roads are felled, roads could be reopened and area access would be restored to pre-fire levels. High open road densities would likely affect big game use and distribution, particularly given the lack of hiding cover in the burn area.

The greatest potential for impact is during the hunting seasons, when hunter traffic, and the associated "stimulus" associated with those activities is at the highest level. Restriction periods reduce traffic in the fall and correspond to general deer hunting season and elk hunting season. Open road densities in Table TW-3 do not reflect seasonal closures. These closures would further reduce open road density and increase HEr and HEI values. Seasonal closures provide an increased level of security for the portion of the year that the closure is in effect.

Perhaps more important than the impacts of road densities upon elk habit use and selection is the spatial relationships of those roads. Rowland et. al, (2001) and Wisdom et. al, (1998) analyzed the impact of road distribution and its impact and predictive aspects of elk habitat use. They found strong correlations between the distance from a road and the likelihood of selection of habitat. Road influences were found out beyond 1,000 meters. Elk were increasingly found in areas further and further away from roads, while those areas with many roads and limited distances between roads received very limited use. In the Easy project area, the existing road network provides very few of these locales. This provides very few areas of security where deer and elk can select habitats free from road influences. The presence of these roads likely adversely impact the habitat effectiveness of cover and forage habitats to a substantial degree, and perhaps more so than a simple road density model would indicate.

The impact that elk distribution has on deer distribution is related to the influence of road spatial arrangement on habitat selection. Wisdom et. al, (1998) looked not only at elk distribution relative to road influences, but at mule deer distribution as well. Essentially, the interaction was the inverse of what the elk were doing. While elk presence and distribution increased the further away from open roads one got, the exact opposite occurred with mule deer. Habitat selection by mule deer was highest near roads and fell off quickly as distance from roads increased. Additional work by Wisdom et. al, (1998) strongly suggest that this is the result of intraspecific competition and resulting displacement by the presence of elk in habitats further from those open roads. It is important to note that mule deer did select specific habitats and habitat patterns relative to their close proximity to open roads. As would be expected, mule deer selected strongly towards high quality cover habitats and forage habitats closely associated with cover (Wisdom et al. 1998). Like elk, the mule deer's response to the spatial context of open roads (and their interaction with elk) is significant, and much better explained with a spatial analysis rather than a simple road density analysis.

Environmental Consequences - Big Game Habitat

Direct and Indirect Effects - No Action

Elk and deer are already using the burn area (pers. obs.). Forage is expected to recover rapidly. Plants tend to sprout vigorously from the roots if the above ground portions are killed by fire, although it might take 2 to 5 years for grasses, sedges and forbs to return to their pre-fire abundance and volume. Shrub recovery may take 2 to 15 years. Fire can also increase nutrient content and palatability of forage, although the increased quantity of forage after a fire may be more significant than the increased quality of that forage (USDA, 2000). As stated in the existing condition section, elk and deer will likely forage in the burn area during the night and retreat to security areas during the day.

Most of the fire-killed trees are expected to be on the ground within 10 to 20 years. Large concentrations of down woody material could impede big game movements (Thomas et. al, 1979; Thomas & Toweill, 1982). Consequently, the highest use of the area may be in the first 10 years, after forage has redeveloped and before many of the trees have fallen.

Excessive fuel loads would preclude the opportunity to use prescribed fire in the future. Historically, most of the subwatershed was shaped by frequent, low intensity fires, which reduced fuels levels and encouraged the growth of more succulent forage, ultimately benefiting deer and elk.

The fire destroyed most of the cover within the fire area. Alternative 1 would not further reduce cover. Development of cover would depend on natural regeneration, no planting would occur under this alternative. In the severely burned areas, recovery of hiding cover may take 35 to 65 years. Marginal cover would take 60 to 90 years to develop; satisfactory cover would likely take 90 to 120 years. Dead tree boles might offer some hiding cover, but only where snag densities are high, and even then it is of limited value compared to a similar live, green tree situation. Most of the small diameter dead trees will be on the ground in 10 years, so what does exist is short-lived. Lack of fuel treatment under this alternative would create a high risk for an intense reburn of the area; such a fire could further delay development of cover.

The "No Action" Alternative would not close Rd 2600391 but would maintain the seasonal closure; the road density would decrease to 3.0 mi/mi^2 due to existing EA's and ATM's. Open road densities would remain in excess of standards in the Clear Creek and Bridge Creek subwatersheds; only the Reynolds Creek subwatershed would meet the open road density standard. High open road densities reduce security and increase the potential for disturbance, especially given the lack of hiding cover. During the hunting season, elevated human use and hunting pressure in the cover-deficient burn area will likely force animals into adjacent unburned areas.

Overall, deer and elk use in the area would likely increase in the first 10 years in response to the flush in forage. After 10 years, use would decrease as high concentrations of downed trees limits big game movement and natural regeneration delays development of hiding/thermal cover. Habitat effectiveness would remain better in adjacent unburned areas. Population numbers are expected to remain stable; distribution and use may change initially as a result of improved forage and then change again due to the subsequent build up of fuels as snags fall.

As discussed in the existing condition section, antelope primarily use the large open landscapes to the west and southwest. Although the fire opened up landscapes, the high density of standing dead trees may still preclude high use. As with deer and elk, antelope may take advantage of the initial flush of forage. Otherwise, the no action alternative is likely to have little affect on existing antelope populations and distribution.

Direct and Indirect Effects - Alternatives 2, 3, 4, and 5

As described under the No Action Alternative, deer and elk use will increase as grasses, forbs and shrubs recover. Elk and deer will likely forage in the burn area during the night and retreat to security areas during the day. By removing trees, salvage harvest would limit the future build up of ground fuels. In Alternatives 2, 3, and 4 much of the burn area would be available for high quality forage until tree canopy recovers and begins to limit the development of ground vegetation. In Alternative 5 concentrations of downed logs could impede big game movement as described in Alternative 1.

Salvage of dead and dying trees would not directly impact remaining marginal and satisfactory cover, as only fire-killed trees would be salvaged, while leaving green trees expected to survive. Salvage logging would not have a significant effect on hiding cover. Dead tree boles offer little security and what little cover they provide would decrease as the snags fall. It is likely that many individual animals have already been displaced by the fire and are using surrounding areas with better habitat.

Planting would accelerate reforestation, allowing hiding cover and thermal cover to develop sooner than under a natural reforestation scenario. In the severe burn areas, recovery of hiding cover would take 15 to 25 years versus 35 to 65 years under the No Action scenario. Marginal cover would develop in about 50 years versus 60 to 90 years under the No Action alternative. Satisfactory cover would likely take 80 years to develop versus 90 to 120 years under the No Action alternative. Alternative 5 would plant fewer acres, severely burned areas only, but would speed development of cover as described above.

Under Alternatives 2, 3, and 4 salvage and fuels reduction activities would reduce the potential for excessive build up of fuels in 10 to 20 years as snags fall. Salvage would permit the use of prescribed fire in the future to maintain low fuel loads and encourage the growth of more succulent forage, ultimately benefiting deer and elk. Fire risk would still be elevated in 10 to 20 years as snags fall and fuel concentrations increase; particularily in areas where higher densities of snags are being retained. Another stand replacement fire could further delay development of cover. Excessive fuel loads would also preclude the opportunity to use prescribed fire in the future.

Open road densities would increase slightly during the logging operations. Roads would be opened to provide for logging access and log haul. In addition, Alternatives 2, 3, and 4 would construct new temporary roads. Alternative 2 constructs 0.7 miles of temporary roads. Alternative 3 constructs 0.5 miles of temporary road. Alternative 4 constructs 0.2 miles of temporary road. The amount of temporary road construction is insignificant compared to the total miles of road in each subwatershed. Alternative 5 proposes no temporary road construction. The amount of temporary road construction and opening of closed roads is insignificant compared to the total miles of road in each subwatershed. The temporary roads will not significantly impact big game by increasing access into the area. There are few areas within the fire perimeter or the subwatersheds where it is possible to be 1,000 meters from a road.

Under Alternatives 2, 3, 4, and 5, it is recommended that the seasonal closure for big game security for Forest Rd 2600391 recommended in the Clear EA be extended to a year-round closure. The closure would be accomplished with a gate. Administrative access would be allowed. The fire area along this road burned with moderate to high severity, virtually all cover value has been lost. The year round closure would provide for more security for deer and elk that utilize this area. The temporary closure during the hunting seasons provides an increased level of security during the closure. However, due to the reduced amount of cover available in the area the year-round closure would provide that security all year long. The recommendation to extend the closure of Forest Rd 2600391 from a seasonal closure to a year-round closure in combination with planned closures in existing EA's and ATM's would reduce the road density of the Clear Creek subwatershed from the current 4.2 mi./mi.^{2} to 2.8 mi./mi.^{2}. The road closure would also improve the values of HE_R and HEI. With the road density reduced to 2.8 mi./ mi.^{2}by the closure of Forest Rd 2600391 and other road closures planned in other EAs and ATM plans; the HE_R would increase to 0.41 (Table TW-4).

The Clear Creek, and Bridge Creek subwatersheds do not meet Forest Plan standards for open road density. Alternative 2, 3, 4, and 5 close additional roads within the burn areas. Following road closures the Clear Creek subwatershed would be moved towards the standard. In future environmental analyses, additional road closures would likely be considered in the unburned portions of the subwatersheds. Planting will accelerate recovery of vegetation and development of hiding and thermal cover.

The temporary road construction associated with proposed salvage operations would have no net long term effect on road densities. All road construction will be temporary. These roads will be decommissioned upon completion of this project.

Impacts to deer and elk, from salvage operations, are expected to last only 1 to 3 years, as there is great economic incentive to salvage dead and dying trees quickly. Disturbance during logging is expected to be minimal as animals are already expected to move out of much of the fire area during the day due to the lack of hiding cover. The timber sale purchaser would close temporary roads that would be used for log haul; the Forest Service would be responsible for closing Road 2600391 and for opening and closing of other roads for post-salvage projects such as tree planting.

Table TW-4: Open Road Density, Habitat Effectiveness for Open Roads (HEr) and Total HEI (Habitat Effectiveness Index)

Alternative	Open Road Density (miles per square mile)	HEr*	HEcsr (HEI)*
Forest Plan Standard	3.2	0.40	0.40
Bridge Creek			
Existing	3.7	0.32	0.54
Alt. 1	3.5	0.34	0.55
Alt.'s 2, 3, 4 and 5	3.5	0.34	0.55
Clear Creek			
Existing	4.2	0.28	0.49
Alt. 1	3.0	0.39	0.55
Alt.'s 2, 3, 4 and 5	2.8	0.41	0.55
Reynolds Creek			
Existing	2.9	0.40	0.55
Alt. 1	2.0	0.49	0.59
Alt.'s 2, 3, 4 and 5	2.0	0.49	0.59

*HEI = Habitat Effectiveness Index

*HEr = habitat effectiveness derived from the density of roads open to vehicular traffic

*Open road densities in this table do not reflect seasonal closures. These closures would temporarily reduce open road density and increase HEr and HEI values.

Following implementation, road closures and decommissioning of temporary roads would reduce open road densities to below that which existed prior to the fire. Alternative 1 reflects the existing condition and No Action alternative. All alternatives maintain existing cover.

New road closures were only considered in the burn areas, however opportunities are limited. Many roads are being closed under the Mossy and Clear EAs. Some roads were reopened during fire suppression activities and have not been reclosed yet. Those roads that are utilized during salvage operations will be reclosed by the purchaser. The remaining reopened roads will be reclosed by the Forest Service.

Reducing open road density would decrease the potential for human disturbance to big game, resulting in greater use of available habitat, less unnecessary energy expenditure, and greater escapement from hunters. This would positively affect big game and other species that prefer low human disturbance, particularly given the high loss of hiding cover from the fire. The open road indices (HEr) improve as a result of the road closures (Table TW-4).

Overall, habitat effectiveness for deer and elk would be expected to improve over time. Road closures have the most immediate effect by reducing the potential for disturbance and improving habitat effectiveness. Salvage reduces the future build-up of down logs that could impede big game movements. Tree planting accelerates development of hiding and thermal cover.

As discussed, in the existing condition section, antelope primarily use the large open landscapes on private lands to the west and southwest. Although the fire opened up landscapes, the high density of standing dead trees may still preclude high use. As with deer and elk, antelope may take advantage of the initial flush of forage. Alternative 2, 3, 4, and 5 are likely to have little affect on existing antelope populations and distribution.

Cumulative Effects - All Alternatives

All of the activities listed in "Past, Present, and Reasonably Foreseeable Actions" (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on old growth and associated species. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

The existing condition section describes cover, forage, and open road density conditions immediately following the fire. In Table TW-3, cover, road density, and habitat effectiveness values reflect all past and ongoing timber management and access management activities. Table TW-4 displays habitat effectiveness values following implementation of the alternatives and all foreseeable closures. Additional planned projects (FEIS Chapter 3, Cumulative Effects) are not expected to change these values in the short-term.

None of the alternatives would immediately contribute any adverse cumulative effects to big game habitat. No thermal or hiding cover is removed. Alternatives 2, 3 and 4 would contribute positively to cumulative effects by accelerating the development of hiding cover and thermal cover. Alternative 5 would contribute to cover development to a lesser extent because only the severely (vegetation severity) burned areas would be planted.

Under Alternative 1 and 5 the elevated fuel loads expected in 15 to 30 years increase the risk of an intense re-burn; another stand replacement fire could further delay development of cover. Alternatives 2, 3, 4 also leave some burn areas untreated, but salvage logging and fuels treatments would reduce fuel loads overall and break up the continuity of fuels remaining.

There may be adverse effects from the elevated road use that is expected. One potential source will be from log haul during salvage operations. Although this should be minor due to expected decrease in use by big game of most of the area during the day due to the reduction of hiding cover. Firewood cutting is also expected to increase as a result of the fire.

Road densities in three subwatersheds will continue to decrease as the Mossy, Punch, and Clear Creek Access Management Plans are more fully implemented. For example, the road density in Clear Creek, with the closure of Rd 2600391 and other road closures planned in other EAs and ATM plans; is expected to decrease to 2.8 mi./sq. mi., lower than the Forest Plan Standard. Similar decreases are expected in the Reynolds and Bridge subwatersheds.

In burned riparian areas, hardwood and conifer planting is being planned under separate NEPA documents. Cumulatively, restoration activities would improve forage, hiding cover, and fawning and calving habitat. Livestock grazing would be delayed for at least two growing seasons post-burn to allow for recovery of ground cover (Post-Fire Interim Grazing Guidelines, 2003).

Reforestation is required where commercial timber harvest has occurred and the land is left under-stocked. Some conifer tree planting was accomplished during the spring of 2003 and 2004. This was done under existing NEPA documentation.

Future timber management and access management activities have yet to be proposed for the unburned areas of the affected subwatersheds. Since the Easy Recovery Project is expected to have little to no effect on big game habitat in the short term, and since future nearby activities will be designed with recognition of habitat losses due to the fire, cumulative adverse effects to big game are expected to be incidental regardless of the alternative selected.

Big Game Habitat Summary

The primary differences in alternatives relate to cover recovery and road closures. Under all alternatives, overall habitat effectiveness for deer and elk would be expected to improve over time as cover develops.

Under Alternatives 2, 3, 4, and 5 planting would accelerate reforestation, allowing hiding cover and thermal cover to develop sooner than under a natural reforestation scenario. In the severe burn areas, recovery of hiding cover would take 15 to 25 years versus 35 to 65 years under the No Action scenario. Marginal cover would develop in about 50 years versus 60 to 90 years under the No Action alternative. Satisfactory cover would likely take 80 years to develop versus 90 to 120 years under the No Action alternative.

Road closures have the most immediate benefit to deer and elk by reducing the potential for disturbance, particularly given the loss in hiding cover from the fire. Disturbance would be elevated during logging operations, and then reduced as road closures are implemented. Alternative 2,3,4, and 5 slightly reduce open road densities within the fire area. Few opportunities exist for additional road closures, many roads in the Clear Creek and Reynolds Creek subwatersheds are being closed under the Clear or Mossy EAs. There will be no net increase in open road miles within the Clear Creek, Reynolds Creek, or Bridge Creek subwatersheds. The No Action alternative does not increase or decrease open road densities.

Salvage logging reduces the future build-up of down logs that could impede big game movements and elevate the risk of a future re-burn. Alternative 2 salvage logs the most acres (1,777 acres), followed by Alternative 3 (1,298 acres), and Alternative 4 (956 acres).

Existing Condition - Primary Excavator Species

In the eastside mixed conifer habitat type 65 bird and mammal species are known to use snags for nesting or shelter and 61 vertebrate species make use of downed logs. The lodgepole pine habitat type provides nesting or shelter in snags for 50 species of birds and mammals while down wood provides habitat for 43 vertebrate species. The ponderosa pine/Douglas fir provides 70 species of birds and mammals with snags for nesting and shelter, and down wood for 49 vertebrate species (Mellen et. al, 2003). Primary cavity excavators, such as woodpeckers, sapsuckers and flickers, are forest dwelling birds that are specialized for nesting and foraging in decayed wood. They require trees with rotted heartwood for excavating nest holes and use both snags and down logs for foraging.

The Forest Plan identifies 11 primary cavity excavators as management indicator species (MIS) for the availability and quality of dead and defective wood habitat: black-backed woodpecker, three-toed woodpecker, Lewis' woodpecker, white-headed woodpecker, pileated woodpecker, downy woodpecker, hairy woodpecker, northern flicker, Williamson's sapsucker, red-breasted sapsucker and yellow-bellied sapsucker. The red-breasted and yellow-bellied sapsuckers were formerly classified with the red-naped sapsucker. Neither the red-breasted or yellow-bellied sapsucker are known to occur in eastern Oregon; the red-naped sapsucker does occur throughout the area and will be used as a substitute MIS in this discussion. By providing habitat for these primary cavity excavators, habitat is provided for many other dead wood dependent species as well.

The Easy fire burned within an area of 5,839 acres of the Malheur National Forest, all of which were forested. About 3,002 acres or 52% of the fire burned severely over large areas, resulting in nearly total mortality. Another 1,870 acres or 32% of the fire burned with moderate severity and included stands that were usually completely underburned, with fully consumed holes in the canopy, and relatively high mortality to individual trees. In the remaining light severity areas, about 749 acres, or 13% of the fire burned in more of a mosaic pattern, with many more patches of tree survival or light to moderate underburns. About 61 acres or 1% of the fire was identified as having burned with partial severity. These areas were generally within the riparian zone of Clear Creek and burned hot in places and lightly in others. Only about 157 acres within the fire perimeter, or 2% did not burn, and consisted mostly of existing plantations. In the severe and moderate mortality areas, most of the pre-fire snags and down logs were consumed. In the light and no-mortality areas, pre-fire snags and downed wood habitats are relatively intact.

The fire created an abundance of new snags. Post-fire density, size and distribution of snags are a result of several factors: fire severity, past harvest, stand age, tree species composition, and the effects of past disturbances such as wind, fire, pathogens, and insects. Post-fire snag densities were estimated at 1 to 130 snags per acre, 10 inches DBH or greater and snags greater than 20 inches DBH range from 0 to 26 snags per acre. Stands that were classified as OFMS, YFMS, and UR pre-fire, currently have the most large diameter snags. Snag estimates are calculated at the stand level.

Habitats in the project area are generally dry ponderosa pine/Douglas-fir sites and lodgepole pine accounting for 77% of the acreage; the moister mixed conifer type makes up the remainder. Stand densities are generally lower on the dryer sites than in the moister mixed conifer sites due to lower site productivities, southerly aspect slope conditions, and dryer habitat conditions. Even in severe burn conditions, these vegetation types would not be expected to produce high snag densities under historic stand conditions and fire regimes (Tables TW-5 and 6). Table TW-5 indicates that 41% of the ponderosa pine/Douglas fir types and 13% of Blue Mountain mixed conifer type currently support snag densities in the highest snag density group (Group #10, snags $\geq$ 10"dbh). The lodgepole type in Table TW-6 currently has 46% of its acres in the highest density group (Group #10, snags $\geq$ 10"dbh).

Primary cavity excavators use burned forest habitats and green forest habitats differently. Tree canopy cover, understory shrub and grass cover, and snag numbers and qualities are all different. Snag habitats in post-fire environments are unique for several reasons: 1) early post-fire forests and associated insect outbreaks result in a rapid increase in nest sites and food supplies, 2) initially, most of the new snags are "hard" snags consisting of sound sapwood that may delay use by species that prefer "soft" snags, 3) many woodpecker species appear to respond positively to burned habitats, with some species using them as source habitats, and 4) fires leave few or no green trees for future snag replacements.

Among the management indicator species, the black-backed woodpecker, three-toed woodpecker, hairy woodpecker, Lewis' woodpecker and northern flicker are strongly associated with post-fire habitats whereas the pileated woodpecker, white-headed woodpecker, downy woodpecker, red-naped sapsucker and Williamson's sapsucker have much lower associations (Saab & Dudley, 1997; Hutto, 1995; Sallabanks, 1995).

The large numbers of snags created by a fire provide relatively unlimited nesting and foraging sites and probably contribute to good nest success and high productivity. Species are likely only limited by other habitat components such as territory size, canopy cover, and snag properties (i.e. hard snags versus soft snags).

Fire-hardened snags and non-fire hardened snags or soft snags provide different niches for various woodpecker species. Some opportunistic birds, such as black-backed, three-toed and hairy woodpeckers, are capable of excavating nests in harder trees; other species, such as Lewis' woodpecker and the northern flicker, require softer snags for excavating nest sites (Raphael & White, 1984). Initially in burned areas, snags are primarily fire-hardened snags. Eventually, fire-killed trees that were previously sound soften with decay introduced by the multitude of insects that colonize dead and dying trees following a burn. Consequently, various woodpecker species may re-invade post-fire habitats in a series of waves, although there is certainly considerable overlap in use periods.

A key to understanding snag dynamics following fire is to know something about the longevity of snags. Many variables factor into the longevity of snags: condition of the tree before it died, cause of death, soil type, climate, extreme weather conditions, protection of snags by topography or other vegetation, tree species, snag height, and snag diameter. Morrison & Raphael (1993) found that snags created by fire decayed rapidly and fell quicker than those on unburned forests, and that large snags had greater longevity than smaller snags. Knotts (1997) summarized snag fall down rates estimated in various post-fire studies, and concluded that most snags will fall within 10 to 30 years.

In an unburned forest, enough snags are left to provide for 100 percent potential populations, and enough live trees, of various sizes, are left to become snags in the future, ensuring that snag habitat is provided over time. In areas where fire burned severely and killed all or nearly all trees, there are few live, green trees left to become snags in the future. Few snags will be available again until a new forest develops, trees reach sizes useful for woodpeckers, and these trees begin to die.

Regulatory Framework for Dead Wood Habitats

Currently, retention of snags and down logs is based on the Forest Plan as amended by Regional Forester Forest Plan Amendment #2. This Amendment directed Forests to manage snags at the 100% population potential and to use the best available science to determine actual numbers. The Forest Plan, as amended, requires that an average 2.39 snags per acre, 21 inches DBH and greater, be retained. Amended standards for down logs are as follows: 20-40 lineal feet per acre for ponderosa pine types, 100-140 lineal feet for mixed conifer types, and 120-160 linear feet for lodgepole pine types. It is assumed that these snag and down log levels will provide the minimum level required for 100% of potential population levels of primary cavity excavators (LRMP 1990; Thomas, 1979). Overall, the fire area has snags well in excess of Forest Plan standards; conversely, down logs, are well below standards, a situation that will quickly be rectified as snags begin to fall.

DecAID Tool

Subsequent to Amendment #2 direction, Johnson & O'Neil (2001) invalidated the biological potential models. At that time they provided no replacement methodology, but mentioned a Forest Service tool (DecAID) that was being developed. Very recently, DecAID (Mellen et. al, 2003) has been completed. DecAID is an internet-based computer program being developed as an advisory tool to help federal land managers evaluate effects of management activities on wildlife species that use dead wood habitats. The tool synthesizes published literature, research data, wildlife databases, and expert judgment and experience.

It should be noted that DecAID does not model biological potential or population viability. There is no direct relationship between tolerances, snag densities and sizes used in DecAID and snag densities and sizes that measure potential population levels (LRMP, 1990; Thomas, 1979).

Rose et. al. (2001) recommended that caution be exercised in using the regional plot data or inventory data to describe the estimated historical range of conditions in dead wood because it is a sample of only current conditions and lack data on site history. Even if the plots in a 'natural' forest could be identified, snags and down wood have been altered to an unknown degree by fire suppresion and other human influences (Rose et. al. 2001). On the eastside in particular, current levels of snags and down wood may be elevated above historical conditions due to fire suppresion and increased mortality, or may be depleted below historical levels in local area burned by intense fire or subjected to repeated salvage and firewood cutting.

DecAID (Mellen et. al. 2003) cautions against using inventory data of post-fire conditions, because the plots sample conditions arise from a variety of disturbances, including but not limited to fire. The sample plots of older forest might represent at least some post-fire conditions; however, young forest stands originating after recent wildfire are not well represented because they are an extremely small portion of the current landscape. Conditions of stand origin, especially post-fire conditions, are pertinent for interpreting conditions for wildlife species such as black-backed woodpecker that use and select for dense clumps of snags in recent post-fire situations.

For the Easy snag analysis, it is assumed that the unharvested inventory data provides the best picture available for 'natural' conditions in dry forest types. The snag distribution levels provided by DecAID display the potential historic range of distribution that would be found across the landscape. Agee (2002) and Harrod (1998) suggest that historic post-fire densities were likely lower than those displayed by DecAID.

Primary cavity excavators generally prefer larger diameter trees for nesting. In the Forest Plan, snags less than 12 inches DBH are not "counted" as contributing towards habitat. In DecAID, snags less than 10 inches DBH are not counted as contributing towards habitat.

Habitat Types Utilized

Several different habitat types are found within the Easy Fire area; Eastside Mixed Conifer, Ponderosa Pine/Douglas Fir, and Lodgepole Pine. The snag distribution tables (Tables TW-5, 6, 8, 9, and 10) were based on these habitat types. The Lodgepole Pine habitat type is currently under development and unavailable for use (DecAID, 2003). Interpolation of inventory data from the Ponderosa Pine/Douglas Fir, and Mixed Conifer types was necessary to fill this gap. The Lodgepole Pine type was needed to more accurately display the existing condition and desired snag distributions.

Stands within the fire area were classified into the habitat types based primarily on their plant association and plant community type. As we were refining our analysis of snag distributions we found that there were discrepancies in the existing distributions that we were seeing. Discussions with a Plant Ecologist from the Wallowa-Whitman NF and Forest Analyst from the Malheur NF led us to reclassify as Lodgepole Pine part of the stands that had been classified as Mixed Conifer. The rationale for this reclassification is as follows:

When grand fir/grouse huckleberry (ABGR/VASC) plant association burns severely it is set back to a seral stage of ABGR/VASC. That seral stage is a lodgepole pine/grouse huckleberry-pinegrass (PICO(ABGR)/VASC-CARU) plant community type (E. Uebler and C. Johnson, pers. com.). This plant community type tends to produce a large number of smaller snags. This seral stage of ABGR/VASC where lodgepole pine is dominate, tends to perpetuate itself over time when fire returns in less than 100 years. This is not enough time to for grand fir (ABGR) or Douglas fir (PSME) to dominate and grow to large trees again. Also, due to the lower site productivity of these dry sites the numbers of large snags that would be found in the Mixed Conifer type would not be found. These stands are likely to produce few large snags and higher numbers of small snags (E. Uebler and C. Johnson, pers. com.).

Fires in this area are probably more frequent than 100 years. Fire frequency is probably closer to 50-75 years, which would support the perpetuation of the PICO(ABGR)/VASC-CARU plant community type rather then developing to the ABGR/VASC plant association. The Easy fire area appears to be in the path of storm systems producing the frequent lightning strikes that would increase the likelihood of more frequent fires which would tend to perpetuate the lodgepole (PICO) type.

Snag distribution numbers for ≥10"dbh were derived from DecAID histograms for Eastside Mixed Conifer-Blue Mountains habitat type, small/medium trees structural condition. This structural condition was chosen for the snag distribution ≥10"dbh because it is likely to have low numbers of large snags and higher numbers of small snags which is what the lodgepole habitat type would be expected to produce.

Snag distribution numbers for ≥ 20"dbh were derived from DecAID histograms for Ponderosa Pine/Douglas Fir habitat type, small/medium trees structural condition. This structural condition was chosen for the distribution of the ≥20"dbh snags since it would display a low number of large snags which is what would be expected in a lodgepole stand with an expected fire return interval of about 100 years.

The Eastside Mixed Conifer habitat type in the Easy Fire area is generally deficient in snags relative to the recommendations in DecAID. A larger amount of acres of low snag densities is found here. Harvest in mixed conifer stands in any of the harvest alternatives greatly affected the distribution from DecAID recommendations. Virtually all of this habitat type was dropped from proposed harvest; there are 1,309ac (22% of fire area) of this type present, only 29ac (2%) remain in harvest units. Since so few acres of this habitat type are being impacted the discussion in the rest of this section will focus on the Lodgepole Pine and Ponderosa Pine/Mixed Conifer habitat types.

Comparison of Inventory Data

Tables TW-5 and 6 display post-fire snag distributions in the Easy Fire area as compared to inventory distributions derived from DecAID. The DecAID snag distribution was derived from un-harvested inventory plots in Oregon and Washington Eastside forests. Snag distributions are displayed for three wildlife habitat types: Ponderosa Pine/Douglas- fir, Mixed Conifer, and Lodgepole Pine.

The first half of the tables display snag distribution for snags greater than 10 inches DBH. Snag levels are displayed by density group (e.g., density group 1 has 0-4 snags per acre). Note that Ponderosa Pine/Douglas-fir habitat types displays density groups in increments of four (0 to 4, 4 to 8, etc) versus the Mixed Conifer and Lodgepole Pine habitat types which display density groups in increments of six (0 to 6, 6 to 12, etc); this parallels the way inventory data is displayed in DecAID. Percentages reflect the proportion of the forested acres in the Easy Fire project area that have the specified snag densities. The second half of the tables display snag distribution for snags greater than 20 inches DBH. These snag distributions are also displayed as density groups in increments of two (0-2, 2-4, etc.) in all three habitat types.

Table TW-5. Post-fire snag densities by density group (Snags/Acre) for Ponderosa Pine/Douglas-fir and Blue Mountain Mixed Conifer wildlife habitat types.

Density Group (Alpha/Numeric Code)	Ponderosa Pine/Douglas-Fir			Mixed Conifer		
	Snags/Acre	* DecAID Snag Distribution	Easy Existing Condition	Snags /Acre	** DecAID Snag Distribution	Easy Existing Condition
Snags equal to or greater than 10” dbh (24cm)						
1	0-4	52%	12%	0-6	41%	35%
2	4-8	15%	8%	6-12	19%	3%
3	8-12	22%	6%	12-18	15%	6%
4	12-16	7%	6%	18-24	6%	5%
5	16-20	0%	4%	24-30	8%	7%
6	20-24	0%	3%	30-36	6%	4%
7	24-28	0%	5%	36-42	3%	18%
8	28-32	0%	12%	42-48	0%	7%
9	32-36	2%	2%	48-54	0%	3%
10	> 36	0%	41%	>54	0%	13%
Total%		99%	99%		98%	101%
Snags equal to or greater than 20” dbh (50 cm)						
A	0-2	47%	41%	0-2	12%	49%
B	2-4	39%	11%	2-4	28%	3%
C	4-6	8%	11%	4-6	21%	11%
D	6-8	0%	9%	6-8	15%	2%
E	8-10	3%	10%	8-10	10%	9%
F	10-12	0%	7%	10-12	7%	10%
G	12-14	0%	6%	12-14	1%	1%
H	14-16	0%	4%	14-16	1%	10%
I	16 –18	0%	1%	16 –18	0%	4%
J	>18	0%	0%	>18	3%	3%
Total%		100%	100%		98%	101%
DecAID Inventory Data: * Wildlife Habitat Type = Ponderosa Pine/Douglas-fir; Structural Condition = Larger Trees; ** Wildlife Habitat Type = Blue Mountain Mixed Conifer; Structural Condition = Larger Trees Percentages may not tally to 100% due to rounding.						

Table TW-6. Post-fire snag densities by density group (Snags/Acre) for Lodgepole Pine wildlife habitat type.

Density Group (Alpha/Numeric Code)	Lodgepole		
	Snags/Acre	DecAID Snag Distribution	Easy Existing Condition
Snags equal to or greater than 10" dbh (24cm)			
1	0-6	30%	5%
2	6-12	20%	3%
3	12-18	21%	11%
4	18-24	11%	6%
5	24-30	7%	2%
6	30-36	5%	10%
7	36-42	2%	8%
8	42-28	1%	7%
9	48-54	1%	2%
10	>54	4%	46%
Total%		102%	100%
Snags equal to or greater than 20" dbh (50 cm)			
A	0-2	72%	28%
B	2-4	21%	11%
C	4-6	3%	5%
D	6-8	0%	13%
E	8-10	0%	10%
F	10-12	0%	0%
G	12-14	0%	3%
H	14-16	0%	5%
I	16 –18	0%	14%
J	>18	0%	11%
Total%		96%	100%
DecAID Inventory Data: Density Group >= 10" from mixed conifer, small/medium trees structural condition. Density Group >=20"dbh from ponderosa pine/Douglas fir, small/medium trees structural condition. Percentages may not tally to 100% due to rounding.			

It is useful to compare existing snag distributions in the Easy Fire area to those in the DecAID inventory data. Tables TW-5 and 6 indicate that total snag levels (snags 10" DBH and greater) in the fire area are much higher than snag levels displayed in DecAID. This disparity is particularly obvious when comparing density group 10. The large diameter snag densities (snags 20" DBH and greater, density groups A-J) are elevated in the lodgepole type when compared to the DecAID inventory, but the difference is noticeably reduced. Therefore, the Easy project area may be providing far more habitat for cavity excavator species than is typical for these forest types.

Comparison of Wildlife Use Data:

Data in DecAID suggests that snag level and down log levels for some primary cavity excavators may need to be higher than the levels based on 100% of biological potential population models as are required by the Forest Plan. Post-fire snag numbers in Easy were compared against woodpecker use data in DecAID. DecAID suggests that post-fire habitats would need to provide much higher levels of snags than live, unburned forests to support use by primary cavity excavators. The ponderosa pine/Douglas-fir, and mixed-conifer wildlife habitat types both have post-fire data. Agee (2002) and Harrod (1998) suggest the post-fire snag numbers in the ponderosa pine dry forest type that are represented in DecAID may be higher than what would 'naturally' be found. The Lodgepole Pine habitat type is still under development so the interpolated lodgepole pine developed for this project was used.

DecAID presents information on wildlife use based on snag density and snag diameter. This information is presented at three statistical levels: low (30% tolerance level), moderate (50% tolerance level), and high (80% tolerance level). A tolerance level can also be defined as an "assurance of use" or the likelihood that individuals in a population of a selected species will use an area given a specified snag size and density. For instance, at the 30 percent tolerance level for any given species, it would be expected that only 30 percent of a population would find suitable or usable habitat at the specified snag density. Consequently, 70 percent of a population would *not* find suitable habitat conditions in habitats at that snag density.

Snag density, size and distribution influence use levels and vary by individual species. For example, post-fire data in DecAID suggests that Lewis' woodpecker would need 10 snags/acre to meet the 30% tolerance level, whereas black-backed woodpeckers would need 62 snags/acre.

It should be noted that DecAID does not model biological potential or population viability. There is no direct relationship between tolerances, snag densities and sizes used in DecAID and snag densities and sizes that measure potential population levels (Mellen 2003, USDA Forest Service 1990, Thomas 1979).

Primary cavity excavators generally prefer larger diameter trees for nesting. In the Forest Plan, snags less than 12 inches DBH are not "counted" as contributing towards habitat; in DecAID, snags less than 10 inches DBH are not counted as contributing towards habitat.

Table TW-7 displays the percentage of total suitable habitat in the Easy Fire area by cavity nesting species and tolerance level. Values are displayed for five species that the Forest Plan identifies as Management Indicator Species (MIS). For the remaining MIS in the Forest Plan, DecAID does not provide wildlife use information for post-fire habitats; effects discussions will be more qualitative than quantitative.

Table TW-7. Existing tolerance level for cavity nesting species within the fire area

Species	Percentage of total suitable habitat in Easy Fire area by Tolerance Level*			
	<30% Tolerance Level	30% Tolerance Level	50% Tolerance Level	80% Tolerance Level
Black-backed Woodpecker	74%	15%	10%	0%
Hairy Woodpecker	22%	39%	28%	11%
Lewis' Woodpecker	18%	37%	38%	6%
Northern Flicker	37%	56%	7%	0%
White-headed Woodpecker	31%	37%	25%	8%
Percentages may not tally to 100% due to rounding.				

Generally, post-fire habitat conditions are considered ideal for primary cavity excavator species, but Table TW-7 suggests that even under the best of situations, snag densities in the Easy area will provide for few species at the 80% tolerance level. Habitats in the Easy project fire area are generally dry ponderosa pine and lodgepole pine or moist mixed conifer types. Snag densities are generally lower in the ponderosa pine/Douglas-fir than in moist, mixed conifer sites due to drier habitat conditions, southerly aspects, and lower site productivities, slope conditions. The lodgepole pine habitat type will generally have high densities but of smaller trees. Even in severe burn conditions, these vegetation types would not be expected to produce ultra high snag densities.

The Lewis' woodpecker, white-headed woodpecker, and hairy woodpecker have the highest levels of habitat available to them as a result of the 2002 fire (see Table TW-7). Both species are strongly associated with fire (Hutto 1995, Sallabanks 1995, Saab and Dudley 1997, Saab et al. 2002). Lewis' woodpeckers use burned forests because of the relatively open canopy that allows for shrub development and associated arthropods prey, perch sites for foraging, good visibility, and space for foraging maneuvers (Saab et al. 2002, Marshall 1992b, Jackman 1974, Raphael and White 1984, Saab and Dudley 1997). Maximum use may be delayed for several years until fire-killed trees begin to fall, stands become more open, snags are well decayed and shrub densities have increased. Hairy woodpeckers are capable of excavating nests in harder snags, and therefore, are expected to rapidly invade the burned area (Raphael and White 1984).

Northern flickers respond positively to fire (Hutto 1995, Sallabanks 1995, Saab and Dudley 1997). Snag densities in the Easy fire area support use primarily at the 30% tolerance level. Data in DecAID suggests that stands would need to have over 17 snags per acre greater than 20 inches DBH to meet the 50% tolerance level (Mellen 2003).

The black-backed and three-toed woodpeckers tend to favor areas with high snag densities; therefore, these species have benefited from the fire, but at relatively low levels compared to the other species. For the black-backed woodpecker, 15% of the project area meets the 30% tolerance level; 10% meets the 50% tolerance level. Even though DecAID suggests that snag densities in Easy will only provide for black-backed woodpecker up to the 50% tolerance level, populations are expected to respond favorably compared to pre-fire conditions, which provided poor habitat. Black-backed and three-toed woodpeckers begin to use burned habitat shortly after the fire; they are strong excavators and can drill into newly created, hard snags. The relatively low number of black-backed woodpeckers in unburned forests may be sink populations (populations that are generally decreasing), maintained by emigrants from burns when conditions in a fire area become less suitable; in other words, burns may support source populations of black-backed woodpeckers (populations that increase and spread) (Hutto 1995).

DecAID provides post-fire data for white-headed woodpeckers, suggesting that the Easy Fire area could support use primarily up to the 50% tolerance level. Several studies on white-headed woodpeckers, however, suggest the species is not closely associated with burned habitats (Hutto 1995, Sallabanks 1995, Raphael and White 1984, Saab and Dudley 1997), primarily because of the lack of many live trees. The species primarily forages on live, mature and over mature ponderosa pine, feeding on seeds from cones and scaling tree bark for insects. The species may use large, well-decayed snags in the burned area for nesting, provided that the burned area is within a potential home range that includes large, live ponderosa pine.

Pileated woodpeckers are not strongly associated with post-fire habitats (Hutto 1995, Sallabanks 1995, Raphael and White 1984, Saab and Dudley 1997). DecAID does not provide any post-fire pileated woodpecker use data. The species has a strong preference for mature or old growth stands with high canopy cover (see Chapter 3, Terrestrial Wildlife, Old Growth Habitat). Pileated woodpeckers are unlikely to nest in the fire area, but would likely use the area for foraging if it is within a potential home range that also includes mature or old growth forest with high canopy cover for nesting and roosting.

The red-naped sapsucker, Williamson’s sapsucker and downy woodpecker are not strongly associated with post-fire habitats (Hutto 1995, Sallabanks 1995, Saab and Dudley 1997). DecAID does not provide any post-fire woodpecker use data for these species. Sapsuckers primarily use live trees for foraging; however, they do obtain food by fly catching, gleaning, and pecking, and could take advantage of habitat provided by the numerous dead trees (Jackman 1974). The red-naped sapsucker is strongly associated with forests containing pure stands of aspen or mixed stands of aspen and conifers (Jackman 1974, Hutto 1995). No pure aspen stands existed in the fire area prior to the fire. The downy woodpecker may benefit from the fire; however, they feed and nest primarily in deciduous trees in riparian areas as well.

Post-fire, down logs levels are considered low, even compared to Forest Plan standards. DecAID does not provide wildlife tolerances for down logs. DecAID does summarize inventory information for the ponderosa pine/Douglas-fir, and mixed conifer forest types in eastern Oregon and Washington; information is presented as percent cover of down logs rather than log length. As with snag densities, DecAID suggests that the down log levels were much more variable on the landscape, with some areas having no down logs and other areas having concentrations greater that the Forest Plan standard. Eventually, as snags in the Easy Fire area start to fall, there is an opportunity to mimic a more variable level of down logs.

Environmental Consequences - Primary Cavity Excavators

Post-fire snag retention was raised as a significant issue in this analysis. Several public letters raised concern that cavity dependent species use burned forest habitats differently than live, green forests, and that salvage logging could *potentially* have negative impacts (see Key Issues in Chapter 1). The 1995 Beschta, et. al, report also concluded that cavity dependent species require higher levels of snags in post-fire habitats than are typically required by Forest Plans. Concerns are addressed through this analysis.

The alternatives retain varying levels, sizes and distribution of snags. All alternatives would meet or exceed Forest Plan snag standards, (e.g., 2.39 snags per acre, 21 inches DBH or greater, in the short-term); when calculated at the landscape level and not a per 40ac basis as in the Forest Plan. Consequently, all alternatives would provide for 100% of potential population levels of primary cavity excavators (LRMP, 1990; Thomas, 1979).

Data in DecAID suggests that snag level and down log levels for some primary cavity excavators may need to be higher than the levels based on 100% of biological potential population models. Because of the variation between the biological potential models (LRMP,1990; Thomas, 1979) and DecAID (Mellen et. al, 2003), results of both assessments are provided in this discussion.

As stated in the existing condition section, the black-backed woodpecker, three-toed woodpecker, hairy woodpecker, Lewis' woodpecker and northern flicker are strongly associated with post-fire habitats whereas the pileated woodpecker, white-headed woodpecker, downy woodpecker, red-naped sapsucker and Williamson's sapsucker have much lower associations (Saab & Dudley 1997; Hutto, 1995, Sallabanks, 1995). This effects discussion will focus more fully on the first list of species.

The following sections address effects to primary cavity excavators in three time scales:

- 0-10 years: discusses the effects to species/habitats immediately following implementation of the No Action or an Action Alternative,
- 10-30 years: discusses the effects to habitats as post-fire snags begin to fall,
- 30+ years: discusses time period after which new snag creation becomes an issue

Direct and Indirect Effects

Comparison of Inventory Data

Table TW-8 displays the snag distributions by alternative, and compares them to the inventory distribution derived from DecAID for each habitat type.

In the ponderosa pine/Douglas-fir habitat type the DecAID snag distribution was derived from unharvested inventory plots for this analysis, this distribution is assumed to reflect expected snag levels in this dry forest types.

The table displays the distribution by density groups (e.g., 0-4 snags per acre for snags greater than 10 inches dbh). The first half of each table displays snag distribution for snags greater than 10 inches dbh. The second half of each table displays snags distribution by density group (e.g. 0-2, 2-4) for snags greater than 20 inches dbh. Percentages reflect the proportion of the forested acres in the Easy Fire project area that have the estimated snag densities (e.g., Under Alternatives 1 and 5, 41% of the forested acres in the ponderosa pine/Douglas fir habitat type of the fire area have snag densities in excess of 36 snags per acre greater than 10 inches dbh).

Table TW- 9 displays the snag distribution by alternative, and compares them to the inventory distribution derived from DecAID for mixed conifer habitat type. The DecAID snag distribution was derived from unharvested inventory plots; for this analysis, this distribution is assumed to reflect expected snag levels in that habitat type.

The table displays distribution by density groups (e.g., 0-6 snags per acre for snags greater than 10 inches dbh). The first half of each table displays snag distribution for snags greater than 10 inches dbh. The second half of each table displays snags distribution by density group (e.g. 0-2, 2-4) for snags greater than 20 inches dbh. Percentages reflect the proportion of the forested acres in the Easy Fire project area that have the estimated snag densities (e.g., Under Alternatives 1 and 5, 41% of the forested acres in the Blue Mountain mixed conifer habitat type of the fire area has snag densities in excess of 36 snags per acre).

Discussion of alternatives will minimally address the mixed conifer habitat type; of the 1,309 acres of the mixed conifer type in the project area only 29 acres (2%) will be harvested. Most of the mixed conifer stands were dropped from the project in order to maintain the snags in that type. The snag densities on those acres are low in the existing condition when compared to DecAID.

Table TW- 10 displays snag distribution by alternative, and compares them to the inventory distribution interpolated from DecAID for lodgepole pine habitat type. The DecAID snag distribution was derived from unharvested inventory plots; for this analysis, this distribution is assumed to reflect expected snag levels in that habitat type.

The table displays distribution by density groups (e.g., 0-6 snags per acre for snags greater than 10 inches dbh). The first half of each table displays snag distribution for snags greater than 10 inches dbh. The second half of each table displays snags distribution by density group (e.g. 0-2, 2-4) for snags greater than 20 inches dbh. Percentages reflect the proportion of the forested acres in the Easy Fire project area that have the estimated snag densities (e.g., Under Alternatives 1 and 5, 63% of the forested acres in the lodgepole habitat type of the fire area has snag densities in excess of 36 snags per acre).

Table TW-8. Snag Distribution by Alternative. Wildlife habitat type = Ponderosa Pine/Douglas-fir; Structural condition = larger trees

Density Group (Alpha/Numeric Code)	Snags/Acre	DecAID Snag Distribution	Alternatives 1 and 5*	Alternative 2	Alternative 3	Alternative 4
Snags equal to or greater than 10" dbh (24cm)						
1	0-4	52%	12%	46%	37%	12%
2	4-8	15%	8%	12%	10%	8%
3	8-12	22%	6%	5%	5%	6%
4	12-16	7%	6%	3%	6%	14%
5	16-20	0%	4%	8%	6%	4%
6	20-24	0%	3%	0%	1%	3%
7	24-28	0%	5%	2%	2%	3%
8	28-32	0%	12%	7%	8%	11%
9	32-36	2%	2%	2%	2%	2%
10	> 36	0%	41%	14%	24%	36%
Total%		98%	99%	98%	101%	99%
Snags equal to or greater than 20" dbh (50 cm)						
A	0-2	47%	41%	41%	69%	41%
B	2-4	39%	11%	45%	9%	17%
C	4-6	8%	11%	3%	4%	11%
D	6-8	0%	9%	4%	6%	7%
E	8-10	3%	10%	1%	3%	9%
F	10-12	0%	7%	2%	6%	4%
G	12-14	0%	6%	2%	2%	6%
H	14-16	0%	4%	1%	1%	4%
I	16–18	0%	1%	1%	1%	1%
J	>18	0%	0%	0%	0%	0%
Total%		100%	100%	100%	101%	100%

Percentages may not tally to 100% due to rounding.

*Alternative 5 only removes non-commercial size snags less than 7 inches DBH; therefore, snags levels in this table would be the same as for Alternative 1, No Action.

Table TW-9. Snag Distribution by Alternative. Wildlife habitat type = Blue Mountain mixed conifer; structural condition = larger trees

Density Group (Alpha/Numeric Code)	Snags/Acre	DecAID Snag Distribution	Alternatives 1 and 5*	Alternative 2	Alternative 3	Alternative 4
Snags equal to or greater than 10” dbh (24cm)						
1	0-6	41%	35%	36%	39%	35%
2	6-12	19%	3%	3%	3%	3%
3	12-18	15%	6%	6%	3%	7%
4	18-24	6%	5%	5%	5%	5%
5	24-30	8%	7%	7%	7%	7%
6	30-36	6%	4%	4%	4%	4%
7	36-42	3%	18%	16%	16%	16%
8	42-48	0%	7%	7%	7%	7%
9	48-54	0%	3%	3%	3%	3%
10	>54	0%	13%	13%	13%	13%
Total%		98%	101%	100%	100%	100%
Snags equal to or greater than 20” dbh (50 cm)						
A	0-2	12%	49%	49%	51%	49%
B	2-4	28%	3%	4%	3%	4%
C	4-6	21%	11%	11%	11%	11%
D	6-8	15%	2%	2%	2%	2%
E	8-10	10%	9%	9%	9%	9%
F	10-12	7%	10%	8%	8%	8%
G	12-14	1%	1%	1%	1%	1%
H	14-16	1%	10%	10%	10%	10%
I	16–18	0%	4%	4%	4%	4%
J	>18	3%	3%	3%	3%	3%
Total%		98%	102%	101%	102%	101%

Percentages may not tally to 100% due to rounding.

*Alternative 5 only removes non-commercial size snags less than 7 inches DBH; therefore, snags levels in this table would be the same as for Alternative 1, No Action.

Table TW-10. Snag Distribution by Alternative. Wildlife habitat type = Lodgepole Pine wildlife habitat type (interpolated from DecAID).

Density Group (Alpha/Numeric Code)	Snags/Acre	DecAID Snag Distribution	Alternatives 1 and 5*	Alternative 2	Alternative 3	Alternative 4
Snags equal to or greater than 10” dbh (24cm)						
1	0-6	30%	5%	27%	25%	5%
2	6-12	20%	3%	4%	3%	3%
3	12-18	21%	11%	8%	7%	35%
4	18-24	11%	6%	8%	8%	6%
5	24-30	7%	2%	2%	2%	2%
6	30-36	5%	10%	8%	8%	7%
7	36-42	2%	8%	5%	7%	6%
8	42-48	1%	7%	5%	7%	5%
9	48-54	1%	2%	2%	2%	2%
10	>54	4%	46%	29%	32%	29%
Total%		102%	100%	98%	101%	100%
Snags equal to or greater than 20” dbh (50 cm)						
A	0-2	72%	28%	28%	47%	28%
B	2-4	21%	11%	32%	8%	31%
C	4-6	3%	5%	4%	5%	4%
D	6-8	0%	13%	12%	12%	12%
E	8-10	0%	10%	6%	6%	6%
F	10-12	0%	0%	0%	0%	0%
G	12-14	0%	3%	2%	3%	2%
H	14-16	0%	5%	3%	3%	3%
I	16–18	0%	14%	6%	6%	6%
J	>18	0%	11%	8%	9%	8%
Total%		100%	100%	101%	99%	100%
DecAID Inventory Data: Density Group >= 10” from mixed conifer, small/medium trees structural condition. Density Group >=20”dbh from ponderosa pine/Douglas fir, small/medium trees structural condition. Percentages may not tally to 100% due to rounding. *Alternative 5 only removes non-commercial size snags less than 7 inches DBH; therefore, snags levels in this table would be the same as for Alternative 1, No Action.						

Comparison of Wildlife Use Data: Tables TW-11 through TW-15 display tolerance levels for each primary cavity excavator species as a percentage of the Easy Fire area. Calculations are based on forested acres, all acres within the Easy Fire perimeter were considered forested. The tables display tolerance levels for each alternative. Alternative 5 only removes non-commercial size snags less than 7 inches DBH; therefore, snags levels in this table would be the same as for Alternative 1, No Action.

Table TW-11. Black-Backed Woodpecker. – Wildlife tolerance levels

Alternative	Wildlife Tolerance Levels (% fire area)			
	0-29%	30-49%	50-79%	80% +
1 and 5	74%	15%	10%	0%
2	84%	10%	5%	0%
3	83%	11%	6%	0%
4	81%	12%	6%	0%
Percentages may not tally to 100% due to rounding.				

Table TW-12. Hairy Woodpecker – Wildlife tolerance levels

Alternative	Wildlife Tolerance Levels (% fire area)			
	0-29%	30-49%	50-79%	80% +
1 and 5	22%	39%	28%	11%
2	44%	31%	19%	6%
3	40%	30%	23%	6%
4	22%	48%	23%	6%
Percentages may not tally to 100% due to rounding.				

Table TW-13. Lewis' Woodpecker – Wildlife tolerance levels

Alternative	Wildlife Tolerance Levels (% fire area)			
	0-29%	30-49%	50-79%	80% +
1 and 5	18%	37%	38%	6%
2	42%	31%	24%	3%
3	37%	32%	28%	4%
4	18%	48%	30%	3%
Percentages may not tally to 100% due to rounding.				

Table TW-14. Northern Flicker – Wildlife tolerance levels

Alternative	Wildlife Tolerance Levels (% fire area)			
	0-29%	30-49%	50-79%	80% +
1 and 5	37%	56%	7%	0%
2	56%	40%	4%	0%
3	55%	40%	5%	0%
4	37%	58%	4%	0%
Percentages may not tally to 100% due to rounding.				

Table TW-15. White-Headed Woodpecker – Wildlife tolerance levels

Alternative	Wildlife Tolerance Levels (% fire area)			
	0-29%	30-49%	50-79%	80% +
1 and 5	31%	37%	25%	8%
2	76%	15%	7%	1%
3	68%	17%	12%	3%
4	62%	24%	12%	2%
Percentages may not tally to 100% due to rounding.				

Alternatives 1 and 5

Period 0-10 years

There would be no direct or indirect effects to species such as the black-backed, three-toed, and hairy woodpeckers with selection of Alternative 1. The current condition of habitat for these species would be as described in Existing Condition section and as summarized in tables TW-11 and TW-12. Over the short- to mid-term period, habitat for all three species would be present. Only the hairy woodpecker will have habitat at the 80% tolerance level.

Alternatives 1 and 5 propose no commercial salvage harvest, but would allow hazard tree felling and woodcutting. Alternative 1 proposes no planting other than what is currently being done under existing NEPA. Alternative 5 proposes limited fuels reduction activities removing <7"dbh material on 3,652 acres by grapple piling and hand piling. Alternative 5 also plants 2,524 acres of severely burned forestland; planting should speed up the reforestation of severely burned areas by 20 –50 years.

Alternatives 1 and 5 would provide for the greatest number of snags for primary and secondary cavity excavators. Approximately 5,682 acres of habitat with abundant snags currently exist. Throughout the burn area, existing snags and large down logs would remain undisturbed, providing potential nesting, roosting, and foraging habitat for primary cavity excavators and other species dependent on dead wood habitats such as small mammals, amphibians, and insects. Existing snags would be available in several size classes at varying densities.

The fuels reduction removal of snags <7”dbh, in Alternative 5, will not decrease the number of suitable size snags for woodpecker use. The Malhuer Forest Plan (USDA, 1990) does not consider snags under 12”DBH and DecAID (Mellen et. al., 2003) does not consider snags under 10”dbh as quality habitat for nesting.

In the early post-burn period, primary cavity excavator numbers will likely increase until they are limited by same-species territoriality. Comparing existing snag densities and sizes against those displayed in DecAID (Mellen et. al, 2003) for post-fire habitats, it is expected that snag numbers would support most primary cavity excavators at the 30% to 50% tolerance level, as described in the Existing Condition section.

It is likely that three-toed and black-backed woodpeckers would benefit the most from this alternative as they take advantage of the fire area. Three-toed and black-backed woodpeckers are strongly associated with early post-fire conditions and they tend to select nest sites with the highest snag densities and the least amount of logging (Hutto, 1995; Saab & Dudley, 1997; Haggard & Gaines, 2001; Saab et. al, 2002). These two species, plus hairy woodpeckers, begin to use burned habitat shortly after a fire. They are strong excavators and can drill into the newly created, hard snags. DecAID suggests that snag densities in Easy will provide for black-backed woodpeckers at up to the 80% tolerance level, populations should respond favorably as compared to pre-fire conditions, which provided poor habitat. These woodpeckers require very high densities of snags which are not likely to be found in large areas in the forest types in the project area. Even the existing condition (Table TW-7) does not provide snags to the 80% tolerance level for these species.

Lewis’s woodpecker and the northern flicker would also benefit from this alternative, as a maximum number of large snags would be available for nesting habitat. Both species are strongly associated with fire (Hutto, 1995; Sallabanks, 1995; Saab & Dudley, 1997; Saab et. al, 2002). Maximum use may be delayed for several years until fire-killed trees begin to fall, stands become more open, snags are well decayed and shrub densities have increased.

The red-naped sapsucker and Williamson’s sapsucker would not greatly benefit from the No Action Alternative, since their primary means of foraging is sapsucking live trees (Jackman 1974). However, they do obtain food by fly-catching, gleaning, and pecking, and could take advantage of the numerous dead trees. The downy woodpecker may benefit from these alternatives; however, they feed and nest primarily in deciduous trees in riparian areas.

White-headed woodpeckers do not appear to be closely associated with burned habitats (Hutto, 1995; Sallabanks, 1995; Raphael & White, 1984; Saab & Dudley, 1997), primarily because of the lack of many live trees. The species primarily forages on live, mature and overmature ponderosa pine, feeding on seeds from cones and scaling tree bark for insects. White-headed woodpeckers may use large, well-decayed snags in the burned area for nesting, provided that the burned area is within a potential home range that includes large, live ponderosa pine.

The pileated woodpecker has a strong preference for live canopy cover and would likely benefit only minimally from these alternatives. Pileated woodpeckers may use the burn area for foraging if it is within a potential home range that also includes mature or old growth forest with high canopy cover for nesting and roosting. Hutto’s study (1995) indicated it is a rare to uncommon occupant of early, post-fire communities.

Initially, before snags begin to fall, large down logs may be deficient. In the severely- and moderately-burned areas (84% of the forested acres), most of the down logs were consumed.

In the partial, lightly, and unburned areas (16% of the forested acres), downed wood habitats are relatively intact.

Period 10-30 years: Loss of Post-fire Snags

The benefits primary cavity excavators derived from the fire are somewhat limited in time. Primary cavity species will use the area, increasing in numbers until the time when a sufficient number of snags have fallen to begin to limit the density of woodpeckers.

Most of the smaller snags (10-14 inches DBH) will fall within the first 10 years post-burn, as well as some of the larger snags, decreasing overall snag density. At that point, habitat will be less suitable for black-backed and three-toed woodpeckers, which prefer a high density of smaller, harder snags; it will be more suitable for species such as Lewis' woodpecker, northern flicker, downy woodpecker, white-headed woodpecker, and Williamson's sapsucker, which prefer softer snags and more open habitat. Hairy woodpeckers will still likely use the site extensively. Red-naped sapsuckers may increase, particularly in unburned or lightly burned riparian areas. Pileated woodpeckers nesting would likely remain low.

Raphael & White (1984) estimated expected snag densities at year 15 post-fire given average snag fall down rates. They estimated that 4 hard snags are required today to retain one soft snag at year 15. Achieving a Forest Plan standard of 2.39 snags/acre at age 15 would require retention of about 10 hard snags per acre. Using the findings by Raphael and White, and a No Action strategy, it is expected that snags levels at year 15 would still be well in excess of Forest Plan standards. Snag levels would still meet 100% population potential.

Comparing DecAID values against Raphael and White’s findings, tolerance levels for most primary cavity excavator species would drop to the 30% level by year 15; DecAID values for black-backed woodpecker would drop below the 30% tolerance level.

As snags begin to fall, down log levels would greatly increase thereby increasing denning, nesting, and feeding habitat for down wood dependent species. By year 15, the levels of down wood will meet or exceed the minimum Forest Plan standard. The average lineal length of down wood >12” on the small end would be at least 150’ per acre. Total lineal lengths for down wood from the forest plan for logs >12 on the small end are 20-40ft for ponderosa pine stands, 100-140 ft. for mixed conifer, and 120-160 ft. for lodgepole pine stands.

DecAID distribution for down wood percent cover shows that for the mixed conifer type about 10% of the acres will have a down wood cover of less than 1%, while the ponderosa pine and lodgepole types will have 86% and 68% of the acres respectively in less than 2% down wood cover. These alternatives which harvest no snags will have an average percent cover of approximately 0.5-0.75 averaged over all acres.

Period 30 + Years: Future Snag Recruitment and the No-Snag Gap

An important issue with respect to cavity nesters in stand replacement fire areas is that there are few live trees available to become snags in the near future. While snags are abundant after a fire, once they fall down, snags will not be available again until a new forest develops, trees reach sizes useful for woodpeckers, and these trees begin to die. Although snag levels currently exceed Forest Plan standards, it is expected that most post-burn snags will be on the ground within 30 years.

In forested stands that burned lightly or moderately, sufficient green trees may remain to provide snag replacements either immediately or in a protracted time period as compared to the severely burned areas. Stands with a live tree component comprise about 1757 acres

(30%) within the fire area. Stands that classify as old forest multiple strata (OFMS) or young forest multiple strata (YFMS) have sufficient numbers of large diameter trees to provide snag replacements immediately. However, no OFMS and only 4% of the YFMS survived the fire. There will be few replacement snags available. Stem exclusion open canopy (SEOC) and understory reinitiation (UR) stands would take approximately 20 years to grow 14-inch DBH trees and 70 years to grow 21-inch DBH trees.

In forested stands that burned with high severity, very few or no green trees would be available to become snags in the near future. Stand initiation acres comprise about 3,456 acres (59% of forested acres) within the fire area. Reliance on natural regeneration to reforest these areas delays development of large diameter trees and potential snag replacements. Stand initiation (SI) stands would take 80 to 110 years to grow 10-inch DBH trees, 100 to 130 years to grow 14-inch DBH trees and 150 to 180 years to grow 21-inch DBH trees.

Data in DecAID (Mellen 2003) suggests a snag diameter of 14" DBH would meet the 30% tolerance level for most cavity excavator species, given a sufficient density of snags. Therefore, with no reforestation (Alternative 1), there is a snag gap between 30 years post-fire and 100 years post-fire where large snags could be deficient in the severely burned portions of the project area, a gap of 70 years. If larger snags persist longer than expected, the snag gap would be reduced further, particularly for Alternatives 1 and 5, which retain the most large diameter snags. With reforestation (Alternative 5) the severely burned areas of the fire would be planted, this should reduce the time it will take to develop stands with an average of 14" dbh to about 90 years. This will produce a snag gap of about 60 years. If larger snags persist longer than expected, the snag gap would be reduced further, particularly for Alternatives 1 and 5, which retain the most large diameter snags.

Alternatives 2, 3,and 4

Salvage harvest reduces snags numbers, which adversely affects some primary cavity excavator species, such as the black-backed woodpeckers, and may have a lesser impact on others such as the Lewis' woodpecker. Snag retention levels vary by alternative (see Tables TW-8, 9, and 10) and therefore, effects vary as well.

Under these alternatives, although they remove snags in harvest units, the unharvested areas would contain higher densities of snags than would be found under natural conditions. See tables TW-8, TW-9, and TW-10. Higher percentages of the project area will have snag densities in the higher density groups than what DecAID displays.

In Alternatives 2, 3, and 4 no snags would be removed from riparian habitat conservation areas (RHCAs) unless they need to be felled to reduce safety hazards along open roads. Forested RHCA acres total approximately 418 acres or 7% of the potential forest lands within the burn area.

Harvest does raise the risk of blowdown of residual snags. Alternatives leave a varying mix of snag densities. Snags will be distributed in larger, non-harvested blocks, small patches or dispersed. Blowdown risk is reduced when snags are left in untreated patches. In the light severity burn areas; snags are interspersed with live trees, reducing the risk of blowdown as well. Estimated snag fall down rates incorporate losses expected from blowdown.

In salvage units, snags may need to be felled for operational or safety needs during logging (i.e., landings, skyline corridors, safety). Forest Service personnel contacted the Oregon Occupational Safety and Health Administration (OSHA) for their input on this issue (communication between J. Hensley, Malheur National Forest and L. Wenick, Oregon OSHA, January 2004). Based on discussions with OSHA, logging in fire salvage sales could require that an estimated 5 to 10% of protected snags be felled to meet operational/safety needs. The need to fell protected snags is reduced when salvage logging is conducted within 2 to 3 years post-fire; most snags are still in a *hardened* condition that makes them less of a risk of being danger trees. In the Easy Fire Recovery project, design and mitigation features have been included in the action alternatives to further reduce the potential for loss of protected snags. In salvage units, snags marked for retention would be clumped, where possible, and located at least 150 feet from open roads and other improvements such as fences (see FEIS, Chapter 2, Alternatives Considered in Detail, and Management Requirements, Constraints and Mitigation Measures, Terrestrial Wildlife). If a tree marked for snag retention is required to be felled for operational needs, a snag of equal or larger size planned for harvest would be left as a replacement, where feasible. The loss of protected snags would likely be less than 2%. This would be considered incidental given the level of snags being left.

Alternative 2

Period 0-10 years

Alternative 2 proposes timber salvage on 1,777 acres (30% of forested acres) and no timber salvage on approximately 4,062 acres (70% of forested acres). In salvage units, a minimum of 2.39 snags per acre over 21 inches DBH would be retained where available. Where unavailable, snags from the next smaller size class will be left to meet the requirement. Snags would be left individually and in random clumps, averaged on a 40-acre basis. In helicopter units, all other merchantable trees down to 12 inches DBH would be removed. In tractor and skyline units, all other merchantable and non-merchantable snags down to 9 inches DBH would be removed. Under this proposal, forested RHCAs would not be salvage logged, hazard trees that need to be felled would be left in place

Tables TW-8, 9, and 10 display the post-treatment snag distribution; salvage harvest would aggressively shift snag densities towards the lowest snag density classes with the exception of mixed conifer habitat type. Snag distribution in Alterative 2 better mimics the snag distributions in DecAID than Alternative 1. For example, density group 1 indicates that 46% of the ponderosa pine/Douglas-fir types in the project area would have 1 to 4 snags per acre versus 52% under the DecAID inventory. Density groups 2 and 3 appear low as compared to the DecAID distribution, but density groups 5 through 10 are equivalent or elevated. Densities of snags ≥20”dbh exhibit similar shifts; density group B increases over the DecAID distribution but is markedly higher than the existing condition. Density groups F-I are higher than the DecAID distribution, but are generally lower than the existing condition.

In the lodgepole pine habitat type there are fewer acres in the lower density groups compared to DecAID and a higher percentage of acres in group 10 (>54 snags per acre). The snag distribution in this alternative is skewed more to the higher densities as compared to DecAID, with 51% of the acres having >24 snags per acre while DecAID displays 20% >24 snags per acre in the >10 inch dbh group. The difference in the >20 inch dbh range the difference is more pronounced; in DecAID density groups A and B account for 93% of the acres as compared to 50%.

Alternative 2 would reduce potential roosting, nesting and foraging trees. Tables TW-11 through TW-15 indicate that removing snags would reduce woodpecker use levels for all species. Portions of the project area would still support woodpeckers at the 30% and 50% tolerance level, but far more acres would fall into the 0-29% tolerance level.

Direct effects would primarily be displacement from nests by removal or destruction of nest structures (snags, ground nests) during salvage operations. Adverse effects would likely be higher for such species as black-backed woodpeckers, three-toed woodpeckers and hairy woodpeckers. These species tend to use post-fire habitats first because of their ability to excavate hard snags. Logging would likely be completed within 2 to 3 years of the fire when most snags would still be hard enough to limit use by other species.

Three-toed and black-backed woodpeckers tend to select nest sites with the highest snag densities and the least amount of logging (Hutto, 1995; Saab & Dudley, 1997; Haggard & Gaines, 2001; Saab et.. al, 2002). Consequently, it is unlikely they would use salvage-logged units for nesting or foraging. Non-salvaged acres would provide the only post-fire habitat for these species, comprising 2,701 acres or 46% of the potential forest lands within the burn area, and even then these areas would only provide use at the 50% tolerance level at best. Black-backed woodpeckers respond best to unlogged conditions, and even within non-salvage areas, some snags will be dropped to reduce hazard trees along open roads and to provide woody debris in streams for bank stability.

The Lewis' woodpecker, northern flicker and other species that prefer soft snags to hard snags would begin to expand into the fire area as snags begin to decay and fall, but because of the low post-salvage snag levels, use would still remain well below the 30% tolerance level (see Tables TW-13 and TW-14). Non-salvage areas (46% of forest lands) would provide use at the 30% to 50% tolerance level.

Red-naped sapsuckers and downy woodpeckers would not be significantly affected by the reduction in nesting and foraging habitat, since they stay mostly in deciduous stands of aspen and cottonwoods. Williamson's sapsuckers forage mostly on live trees, and are also unlikely to be affected.

White-headed woodpeckers may be minimally affected. Table TW-15 suggests that white-headed woodpecker habitat would be greatly reduced, but the changes in tolerance levels may be misleading, as discussed in the existing condition section. The species may not use expansive, severe burned areas deficient of live ponderosa pine, instead tending towards the periphery of burned areas where there is a mosaic of live and dead trees. In live, green stands, DecAID suggests that white-headed woodpeckers need far lower densities of snags for use, ranging from 1 to 8 snags per acre greater than 10 inches DBH.

Pileated woodpeckers would probably not be directly affected by the removal of large diameter snags, as studies show they are also rare visitors to early post-fire communities. Indirectly, removal of large diameter snags precludes accumulation of large, down logs, and consequently, reduces future foraging habitat for pileated woodpeckers. In non-salvage areas, the potential for quality foraging habitat would remain high. In the former Dedicated and Replacement Old Growth area 364 salvage harvest would reduce dead wood habitats.

Initially, before snags begin to fall, large down logs may be deficient. In the severely- and moderately-burned areas (84% of the forested acres), most of the down logs were consumed. In the lightly and non-burned areas (16% of the forested acres), downed wood habitats are relatively intact.

Period 10-30 years: Loss of Post-fire Snags

Using the findings by Raphael and White (1984) on fall down rates, i.e., that 4 hard snags would need to be retained initially to produce 1 soft snag at year 15, it is expected that within salvage units nearly all snags would be on the ground by year 15. Snags are expected to be below the 2.39 snags per acre required to meet 100% population potential. By the end of the 30 year period we can expect very few if any snags to remain. Only within non-salvage areas, could snag levels meet 100% population levels.

DecAID values were compared against Raphael & White's (1984) findings. In salvage units, tolerance levels for primary cavity excavator species would drop below the 30% level by year 15. In non-salvage units, sufficient snags would remain to provide for most primary cavity excavators at the 30% to 50% tolerance level; only the black-backed and three-toed woodpeckers would have snag use levels drop below the 30% tolerance level.

As snags begin to fall, down log levels would increase thereby increasing denning, nesting, and feeding habitat for down wood dependent species. By year 15 post-fire, the levels of down wood will meet the minimum Forest Plan standard. Adequate numbers of snags and down wood are being retained in harvest units so this alternative will still meet Forest Plan Standards at this time. Down log distributions in DecAID suggest that 60% of the ponderosa pine/Douglas fir stands in the Easy area should have down logs at 0.1 to 1% cover and 40% of the area should support down logs at levels greater than 1%. Mixed conifer stands would be expected to have <1% cover on only 10% of acres in this type, with 69% of the acres having down wood cover in the 1-4% range. In the interpolated lodgepole pine type up to 36% of the acres in this type could be expected to have a down wood percent cover <1. Under Alternative 2, it is likely that only non-salvage areas could eventually support down logs at levels greater than 1%. This alternative is expected to provide 0.2B3% cover within harvest units. Alternative 2 leaves 46% of the area as non-salvage areas, suggesting that levels could fall short in some areas of those expected. However, this alternative does retain sufficient down wood to meet the Forest Plan Standard and Guide for the 100% population level.

Period 30 + Years: Future Snag Recruitment and the No-Snag Gap

Discussions for the No Action Alternative estimated the number of years it would take before large diameter trees would be available again for snag creation. The No Action Alternative relied on natural regeneration to reforest the burn area. Under Alternative 2, planting can accelerate reforestation and reduce the amount of time burned areas are without large snags.

The primary benefits of planting would be achieved on the 3,002 acres that were severely burned and have essentially no live trees left. On these acres, the time it takes to grow 10-inch DBH trees would be reduced from 80-120 years under the No Action Alternative to 70 years under Alternative 2. The time it takes to grow 14-inch DBH trees would be reduced from 100-130 years under the No Action alternative to 90 years under Alternative 2. The time it takes to grow 21-inch DBH trees would be reduced from 150-180 years under the No Action alternative to 140 years under Alternative 2.

Under Alternative 2, there is a snag gap between 15 years post-fire and 90 years post-fire when snags would be deficient, a gap of 75 years as compared to 70 years under the No Action alternative. Note that the snag gap is greater under Alternative 2. Because initial snag retention under Alternative 2 is so low, the snag gap materializes at year 15 compared to year 30 under the No Action alternative.

Alternative 3

Period 0-10 years

Alternative 3 was designed to provide a broader range of post-fire habitats for primary cavity excavators than the other action alternatives. This alternative proposes timber salvage on 1,298 acres (22% of forested acres) and no timber salvage on approximately 4,541 acres (78% of forested acres).

Primary cavity excavators use post-fire habitats would be different under active management (primarily salvage logging) versus non-management (no logging). In Idaho, studies of salvage logging in post-burn habitats indicated a continuum in habitat use among primary cavity excavators with the extremes represented by black-backed and Lewis' woodpecker (Saab et al. 2002). Generally, black-backed woodpeckers prefer high densities of unlogged trees whereas Lewis' woodpecker prefers to nest in open or partially logged areas. The study suggested that leaving a range of conditions characteristic of these two species would likely incorporate habitat features necessary for other members of the cavity-nesting community. The following snag design elements use this strategy.

Large patches of snags were delineated ranging from 100 acres to 570 acres, totaling 3,139 acres; including RHCAs (418 acres). Overall snag retention levels are increased over those proposed in Alternative 2 to better meet primary cavity excavator habitat needs while still reducing fuel loads near to those that occurred under historical conditions.

Studies show that cavity dependent species select nest sites with higher tree densities and cavity nesters as a group prefer patches of snags as opposed to single snags retained in uniform, even spaced distribution (Rose et al., 2001; Saab et. al, 2002; Kotliar, 2002). Since large patches of snags are being retained with minimal numbers left in the harvest units, snags may not be evenly distributed at the 40-acre basis as required by the Forest Plan, requiring a nonsignificant Forest Plan amendment.

Alternative 3 proposes no timber salvage on 4,541 acres (78% of forest lands). Non-salvage acres include five patches ranging from 100 acres to 570 acres, and stands that were dropped as uneconomical. The largest snag patch was created primarily as a buffer to provide added protection, from increased sedimentation, to Clear Creek which provides habitat for bull trout and steelhead. The other four patches were created by dropping units specifically for this purpose and combining them with units that would be dropped for economic purposes. These patches are significantly larger than Forest Plan Management Area 13 (MA-13) recommendations for three-toed woodpeckers. Minimum management requirements suggest establishing habitat acres of 75 acres for every 2,000 to 2,500 acres (USDA, 1986). The 75-acre patch size also matches recommendations for black-backed and three-toed woodpeckers made in Idaho post-fire studies (Saab & Dudley, 1997; Saab et. al, 2002). No salvage harvest or fuels reduction activities would be conducted in these areas, as these species prefer unlogged conditions.

The distribution of snags in this alternative deviates from the Forest Plan by not leaving snags in small 2-6 acre patches, and by not determining snag densities on a 40 acre basis. Large patches of snags are being retained under this alternative; this distribution better reflects recent research (Rose et al., 2001; Saab et. al, 2002; Kotliar, 2002). This alternative proposes harvest on 1,298 ac; these acres will have very low snag densities. Harvest units will have one or two snags retained to meet down wood standards, plus non-merchantable snags. Designated snag retention areas total 3,139 acres, 54% of the area. Since snags are not being distributed as directed by the Forest Plan a nonsignificant amendment will be required.

Tables TW-8, 9, and 10 display the post-treatment snag distribution; snag densities are shifted towards snag density group 1. Snag densities remain generally higher in density groups 6 - 10 when compared to the DecAID inventory distribution. Density groups 1 and 10 higher than what is seen in the DecAID distribution, suggesting that Alternative 3 leaves more snags than typically occur in dry forest types. In the large diameter snags, density group A is lower than the DecAID inventory (47% in DecAID and 69% for ponderosa pine/Douglas fir) and higher (72% in DecAID and 47% for lodgepole) in the Easy Fire area. This indicates that Alternative 3 maintains higher densities of snags in relation to DecAID although reducing the acres of the higher densities in relation to the existing condition.

The direct effect of this alternative would be the removal of potential roosting, nesting and foraging trees. Tables TW-11 through TWL-15 indicate that removing snags would reduce woodpecker use levels for all species (black-backed, three-toed, hairy, and Lewis' woodpeckers; and northern flicker). Most acres would provide for cavity excavators at the 30% tolerance level, although a range of tolerances would occur over the project area.

Lewis' woodpeckers, in particular, tend to select open or partially logged landscapes for nesting, although they prefer post-logging densities that equate to medium-density, non-burned habitats (Saab et. al, 2002). The relatively open canopies allow for shrub development and associated arthropods prey, perch sites for foraging, good visibility, and space for foraging maneuvers (Saab et. al,. 2002; Block & Brennan, 1987; Marshall, 1992b; Jackman, 1974; Raphael & White, 1984; Saab & Dudley, 1997). Typically, the species does not use burns until several years after a fire, when stands are more open, snags are well decayed and shrub densities have increased (Sallabanks, 1995; Hutto, 1995).

Most non-salvage acres, approximately 4,541 acres (78% of forest lands), would provide snag habitat for most primary cavity excavators at the 30% to 50% tolerance level. These areas provide the greatest opportunities for the black-backed, hairy, and three-toed woodpeckers. Snag densities in non-salvage areas vary considerably, but would likely provide for these species somewhere between the 30% and 50% tolerance levels. Even under the existing condition, the Easy fire does not have snag densities at a level that would support black-backed woodpeckers at the 80% tolerance level. Habitat could be somewhat degraded along open roads if hazard trees need to be dropped for safety reasons. Black-backed and three-toed woodpeckers are likely to use salvage units only for foraging.

Red-naped sapsuckers and downy woodpeckers would not be significantly affected by the reduction in nesting and foraging habitat, since they stay mostly in deciduous stands of aspen and cottonwoods. Williamson's sapsuckers forage mostly on live trees, and are also unlikely to be affected.

Species that do not commonly use burned forest, such as pileated and white-headed woodpecker, would be minimally affected by Alternative 3. The existing condition is not suitable for extensive use by these species because live trees and canopy cover are not available over most of the project area. Snags located along the periphery of the burn may provide the best opportunities for foraging or nesting if they are in close proximity to green stands that provide other critical habitat components. Indirectly, removal of large diameter snags precludes accumulation of large, down logs, and consequently, reduces future foraging habitat for pileated woodpeckers.

White-headed woodpeckers may be minimally affected. Table TW-15 suggests that white-headed woodpecker habitat would be greatly reduced, but the changes in tolerance levels may be misleading, as discussed in the existing condition section. The species may not use expansive, severe burned areas deficient of live ponderosa pine, instead tending towards the periphery of burned areas where there is a mosaic of live and dead trees. In live, green stands, DecAID suggests that white-headed woodpeckers need far lower densities of snags for use, ranging from 1 to 8 snags per acre greater than 10 inches DBH. Pileated woodpeckers would probably not be directly affected by the removal of large diameter snags, as studies show they are also rare visitors to early post-fire communities. Indirectly, removal of large diameter snags precludes accumulation of large, down logs, and consequently, reduces future foraging habitat for pileated woodpeckers. In non-salvage areas, the potential for quality foraging habitat would remain high. In the former Dedicated and Replacement Old Growth area 364, salvage harvest would reduce dead wood habitats.

As snags begin to fall, down log levels would increase thereby increasing denning, nesting, and feeding habitat for down wood dependent species. By year 15 post-fire, the levels of down wood would likely meet the minimum Forest Plan standard. Down log distributions in DecAID suggest that 60% of the ponderosa pine/Douglas fir stands in the Easy area should have down logs at .1 to 1% cover and 40% of the area should support down logs at levels greater than 1%. Mixed conifer stands would be expected to have <1% cover on only 10% of acres in this type, with 69% of the acres having down wood cover in the 1-4% range. In the interpolated lodgepole pine type up to 36% of the acres in this type could be expected to have a down wood percent cover <1. Under Alternative 3, it is likely that only non-salvage areas could eventually support down logs at levels greater than 1%. This alternative does meet Forest Plan Standards for down wood retention.

Period 10-30 years: Loss of Post-fire Snags

Using the findings by Raphael & White (1984) on fall down rates, by year 15 post fire virtually all of the snags retained in harvest units will be on the ground. There should still be a significant number of snags remaining standing in the unsalvaged areas simply because of the much greater number of snags in those areas.

DecAID values were compared against Raphael & White's findings. In salvage units, tolerance levels for primary cavity excavator species would start out below the 30% level, by year 15 no snags should be standing. In non-salvage units, sufficient snags would remain to provide for most primary cavity excavators at the 30% to 50% tolerance level; only the black-backed and three-toed woodpeckers would have snag use levels drop below the 30% tolerance level.

Harvest units will not likely provide much useable habitat for Lewis's woodpeckers. Snag retention in harvest units is prescribed at 2 per acre to meet Malheur Forest Plan (USDA, 1990) down wood standards. During this time period snags in the large retention areas will be falling. These areas will begin to provide snag levels suitable to Lewis's woodpecker for 10 – 30 years, after which time snag densities will become too low to support this woodpecker.

As snags begin to fall, down log levels would increase thereby increasing denning, nesting, and feeding habitat for down wood dependent species. By year 15 post-fire, the levels of down wood in salvaged and unsalvaged areas would meet the minimum Forest Plan standard; sufficient snags are being retained in harvest units to meet Forest Plan Standards. Down log distributions in DecAID suggest that 60% of the ponderosa pine/Douglas fir stands in the Easy area should have down logs at 0.1 to 1% cover and 40% of the area should support down logs at levels greater than 1%. Mixed conifer stands would be expected to have <1% cover on only 10% of acres in this type, with 69% of the acres having down wood cover in the 1-4%

range. In the interpolated lodgepole pine type up to 36% of the acres in this type could be expected to have a down wood percent cover <1. Harvest units are expected to have a percent cover of 0.19. Alternative 3 leaves 54% of the area as non-salvage areas. The snag retention areas and mixed conifer stands that were dropped from harvest are expected to provide >1% cover. However, this alternative does retain sufficient down wood to meet the Forest Plan Standard and Guide for the 100% population level.

Period 30 + Years: Future Snag Recruitment and the No-Snag Gap

The primary benefits of planting would be achieved on the 3,002 acres that were severely burned and have essentially no live trees left. On these acres, the time it takes to grow 10-inch DBH trees would be reduced from 80-120 years under the No Action Alternative to 70 years under Alternative 2. The time it takes to grow 14-inch DBH trees would be reduced from 100-130 years under the No Action alternative to 90 years under Alternative 3. The time it takes to grow 21-inch DBH trees would be reduced from 150-180 years under the No Action alternative to 140 years under Alternative 3.

There is a snag gap between 15 years post-fire and 90 years post-fire when snags would be deficient, a gap of 75 years as compared to 70 years under the No Action alternative. Note that the snag gap is greater under Alternative 3 than the No Action Alternative. Because initial snag retention in harvest units under Alternative 3 is so low, the snag gap materializes at year 15 compared to year 30 under the No Action alternative.

Alternative 4

Period 0-10 years

Alternative 4 calls for elevated snag levels in all harvest units, 13 trees per acre would be clumped in 2 – 6 acre patches on a 40 acre basis. In this alternative 956 acres (16%) will be harvested and 4,883 acres (84%) will remain unharvested.

In salvage units, an average 13 snags per acre would be clumped in 2-6 acre patches using the following distribution in size classes: 3 of the snags > 21 inches DBH; 7 of the snags 14 inches to 20.9 inches DBH; and 3 of the snags 10 inches to 13.9 inches DBH. Snag retention levels are higher than those proposed in Alternative 2 and 3 to provide increased cavity excavator habitat while still reducing fuel loads to levels that better mimic historical conditions. Studies show that cavity dependent species select nest sites with higher tree densities and cavity nesters as a group prefer patches of snags as opposed to single snags retained in uniform, even spaced distribution (Rose et al. 2001, Saab et al., 2002, Kotliar 2002).

Alternative 4 retains snags on 3536 acres, 60% of the fire area that has snags. Snag areas include riparian habitat conservation areas (RHCAs) and stands that were dropped as uneconomical due to the higher snag requirements of this alternative. Outside salvage units, all snags 10 inches DBH and greater would be retained except those felled along open roads to reduce safety hazards and those felled to provide coarse woody material for streams, draws, and uplands. Snag retention levels are increased over those proposed in Alternatives 2 and 3 to better meet primary cavity excavator habitat needs while still reducing fuel loads nearer to those that occurred under historical conditions. 1,133 acres of units are dropped because they have become uneconomical with the higher snag levels retained resulting in large areas that will not be harvested.

Primary cavity excavators use post-fire habitats would be different under active management (primarily salvage logging) versus non-management (no logging). In Idaho, studies of salvage logging in post-burn habitats indicated a continuum in habitat use among primary cavity excavators with the extremes represented by black-backed and Lewis' woodpecker (Saab et. al, 2002). Generally, black-backed and hairy woodpeckers prefer high densities of unlogged trees whereas Lewis' woodpecker prefers to nest in open or partially logged areas. The study suggested that leaving a range of conditions characteristic of these two species would likely incorporate habitat features necessary for other members of the cavity-nesting community.

Red-naped sapsuckers and downy woodpeckers would not be significantly affected by the reduction in nesting and foraging habitat, since they stay mostly in deciduous stands of aspen and cottonwoods. Williamson's sapsuckers forage mostly on live trees, and are also unlikely to be affected.

Pileated woodpeckers would probably not be directly affected by the removal of large diameter snags, as studies show they are also rare visitors to early post-fire communities. Indirectly, removal of large diameter snags precludes accumulation of large, down logs, and consequently, reduces future foraging habitat. In salvage units, the low densities of snags left would not provide high quality foraging habitat, although levels would still be better than those expected under Alternative 2. In salvage units, the low densities of snags left would not provide high quality foraging habitat even after snags fall. In non-salvage areas, the potential for quality foraging habitat would remain high. DOG/ROG 364 that were severely burned are being replaced by a new DOG/ROG (see Chapter 3, Terrestrial Wildlife, Old Growth Habitat).

Comparing existing snag densities against those displayed in DecAID (Mellen et. al, 2003) for post-fire habitats, it is expected that snag numbers would support most primary cavity excavators at the 30+% tolerance. Typically post-fire habitat conditions are considered ideal for black-backed woodpeckers, but DecAID suggests that even under the best of situations, snag densities post harvest will provide for use only up to about the 30% tolerance level. Hairy woodpeckers and Northern Flickers would also be supported at about the 30% level (Tables TW 12 and 14).

Snag densities are distributed across the density groups (Tables TW-8, 9, and 10) with the greater number of acres of the ponderosa pine type in density group 10 (>36 snags/acre), or the lodgepole pine in group 10 (>54 snags/acre). These represent densities greater than what is found in DecAID (Mellen et. al., 2003) where snag densities are highest in the lower 3 density groups.

Period 10-30 years: Loss of Post-fire Snags

Using the findings by Raphael & White (1984) on fall down rates, (e.g, that 4 hard snags would need to be retained initially to produce 1 soft snag at year 15), it is expected that retention of 13 snags per acres would generate 3.2 snags/acre at year 15. Snags are expected to be slightly above the 2.39 snags per acre required to meet 100% population potential as established in the Forest Plan.

DecAID values were compared against Raphael & White's (1984) findings. In salvage units, tolerance levels for primary cavity excavator species would drop below the 30% level by year 15. In non-salvage units, sufficient snags would remain to provide for most primary cavity excavators at the 30% to 50% tolerance level; only the black-backed and three-toed woodpeckers would have snag use levels drop below the 30% tolerance level.

As snags begin to fall, down log levels would increase thereby increasing denning, nesting, and feeding habitat for down wood dependent species. By year 15 post-fire, the levels of down wood would likely meet the minimum Forest Plan standard. Snags are being retained at 13 per acre in harvest units. Down log distributions in DecAID suggest that 60% of the ponderosa pine/Douglas fir stands in the Easy area should have down logs at .1 to 1% cover and 40% of the area should support down logs at levels greater than 1%. Mixed conifer stands would be expected to have <1% cover on only 10% of acres in this type, with 69% of the acres having down wood cover in the 1-4% range. In the interpolated lodgepole pine type up to 36% of the acres in this type could be expected to have a down wood percent cover <1%. Under Alternative 4, it is likely that harvested areas as well as non-salvage areas could support down logs at levels greater than 1%. Percent cover in harvest units is expected to be 4.9%.

Period 30 + Years: Future Snag Recruitment and the No-Snag Gap

Under Alternative 4, planting can accelerate reforestation and reduce the amount of time severely burned areas are without large trees, and therefore large snags. The primary benefits of planting would be achieved on the 3,002 acres that were severely burned and have essentially no live trees left. On these acres, the time it takes to grow 10-inch DBH trees would be reduced from 80-120 years under the No Action Alternative to 70 years under Alternative 4. The time it takes to grow 14-inch DBH trees would be reduced from 100-130 years under the No Action alternative to 90 years under Alternative 4. The time it takes to grow 21-inch DBH trees would be reduced from 150-180 years under the No Action alternative to 140 years under Alternative 4. Leaving a greater number of post-fire snags may initially retain snags on salvaged areas longer than Alternative 2 and 3, possibly to year 30 post-fire versus year 15 as under Alternative 2 and 3. Because burned areas will be planted, Alternative 4 is similar to Alternative 5. The snag gap is expected to last from year 30 to year 90, a snag gap of 60 years.

Cumulative Effects - All Alternatives

All of the activities listed in “Past, Present, and Reasonably Foreseeable Actions” (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on primary cavity excavators. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Due to past management including overstory removal, salvage harvest, roadside hazard tree removal, firewood cutting, and fire suppression, snag and down wood quantities have declined from historic levels. In non-harvested areas outside the fire area, snag density is often in excess of the Forest Plan standard of 2.39 snags per acre and provides for 100% potential population levels of most species. In harvested areas outside the fire area, snag density is often below the Forest Plan standard and does not provide for 100 percent population levels.

Current trends indicate that snag and down wood numbers are increasing due to reduced harvest over the past decade and increased required retention levels in accordance with the standard and guidelines in Regional Forester’s Amendment #2. Any future timber harvest or prescribed fire activities would be designed to promote the development of late and old growth habitat and retain a snag and down wood component. Such management strategies are expected to improve habitat for cavity dependent species.

Stand replacement fires are particularly important for species such as the black-backed and three-toed woodpecker. In unburned forests, species numbers are relatively low and may be sink populations (populations that are generally decreasing). Fires serve as source habitats (populations increase and spread); when conditions in a fire area become unsuitable, birds likely immigrate to the unburned areas (Hutto 1995). Consequently, periodic fires may be needed to maintain populations across the landscape.

The two watersheds affected by the Easy fire have had several large fires in the last 12 years (Table TW-17). Fire records before the 1970's were not always kept, but in 1937 the Big Cow fire in the UJDR watershed was documented at 30,790 acres when fire suppression resources were more limited.

Table TW-17: History of Large Fires

WATERSHED	NAME	YEAR	ACRES
UMFJDR	Grouse Knob	1986	23
UMFJDR	Road Creek	1988	12
UMFJDR	Phipps	1996	43
UJDR	Deardorff	1986	945
UJDR	Glacier	1989	9,319
UJDR	Corral Basin	1990	113
UJDR	SnowShoe	1990	11,831
UJDR	Incident 029	1997	161
UJDR	Slide Mountain	2000	411
TOTAL			**22,858**

Data on snag densities is not available; however, ocular estimates indicated many snags have fallen. Salvage reduced snag densities below levels needed for black-backed and three-toed woodpeckers. Other primary cavity species, such as the Lewis' woodpecker, hairy woodpecker and northern flicker, have likely used these habitats, but currently these snags are no longer at decay stages that provide forage opportunities for these species.

RHCAs have been excluded from salvage units; snags will not be salvaged although trees may be felled to reduce hazards along open roads. Some of these trees may be used in streams to meet course woody debris needs. Ephemeral draw buffers can be within units; however, snags retained in these buffers will not be used to meet project snag requirements for primary cavity excavators.

Future firewood cutting could reduce snag and down wood levels further; however, mitigation can be included in logging system design. In the Action Alternatives, snags in salvage units should be located at least 150 feet from open roads where possible. Under current Forest firewood cutting policies, this makes these snags off limits for cutting.

Alternatives 2, 3, and 4 contribute reductions in habitat for primary cavity excavator species. Alternatives 3 and 4 have a lower reduction in potential habitat than Alternative 2. Alternatives 1 and 5, by retaining all snags, would not contribute to further declines in snag habitat.

The Forest Plan requires that snag levels be averaged on a 40-acre basis to maintain an even distribution across the landscape. Retaining all snags in the fire area will not necessarily elevate woodpecker use in snag deficient, unburned areas, except along the periphery of the fire where a mosaic of burned and unburned forest occurs or where territories overlap with the fire area. Black-backed and three-toed woodpeckers may be the exception; these species use post-fire habits as source habitats and immigrate to non-burn areas once snags fall in the burn area.

Projects are being planned simultaneously to plant riparian areas with hardwood species; replanting and planting of plantations is being accomplished under other NEPA documentation. Livestock grazing will not resume in the burn area until ground vegetation recovers. Cumulatively, these actions will help reestablish hardwood vegetation to the benefit of primary cavity species that use these habitats, such as the Lewis woodpecker, red-naped sapsucker, and downy woodpecker.

Cumulatively, retaining high levels of snags within the project area (particularly in the No Action Alternative, Alternatives 3, 4 and 5), along with moving toward the 100 percent population levels in the surrounding area, would ensure that populations of cavity-dependent species would increase over time.

Primary Cavity Excavator Summary

The following table (Table TW-18) summarizes snag densities, cavity excavator use as quantified by DecAID, and snag retention area acres for each of the alternatives. Text following the Table discusses these results.

Table TW-18: Snag Densities, Cavity Excavator Use, and Snag Retention Areas

Resource Issue	Unit of Measure	Alt. 1 and 5	Alt. 2	Alt. 3	Alt. 4
Snag Density in Salvage Units	Snags /Acre	All	2.39	1-2*	13
Snag Retention Areas	Acres (% of forested acres)	4759 (82%)	2701 (46%)	3139 (54%)	3536 (61%)
Down Logs Levels at Year 15 in Salvage Units.	Meets Forest Plan Standards	Yes	Yes	Yes	Yes
	Meets or Exceeds DecAID Levels	Yes	No	No	Yes
Snag Gap in Severely Burned Areas	Years Without Snags	60-70	75	75	60

Alternatives 1 and 5 do not conduct commercial harvest. Data for these two alternatives are presented to show snag levels in the absence of commercial harvest of snags 10” DBH and greater. Alternative 5 conducts fuels treatment of dead tree 8” DBH or less.

* - Requires a Forest Plan Amendment. The 1-2 snags would left for future down logs but will serve as snags today.

The differences in alternatives are best evaluated by comparing 1) predicted snag distributions for each alternative against DecAID snag distributions and 2) predicted woodpecker tolerance or use levels as derived from DecAID.

Comparing Snag Distributions: Inventory data in DecAID provides a suggested snag distribution for ponderosa pine/Douglas-fir, mixed conifer, and lodgepole pine habitat types; the lodgepole type was interpolated from DecAID data for mixed conifer and Ponderosa pine (see Tables TW-8, 9, and 10). The Easy project area may currently support snags at a much higher level than would be typically expected in dry forest types. Following implementation, Alternative 2 may come closest to mimicking the DecAID snag distributions, followed by Alternative 3, then Alternative 4 for all snags greater than 10"dbh. For snags greater than 20"dbh, Alternative 2 comes closest to matching the distribution in DecAID followed by Alternatives 4 and then Alternative 3. Because Alternatives 1 and 5 do not harvest 10+ inch DBH snags, snag densities are highly elevated compared to distributions in DecAID. Therefore, the inventory data suggests that reductions in snag levels or woodpecker use levels could be balanced against other resource needs while still providing sufficient habitat of wildlife species.

Comparing Wildlife Tolerance or Use Levels: Tolerance levels have less to do with viability of species and populations, and more to do with the distribution of individuals across a project area. The alternatives represent different levels of snag retention, and thus would affect woodpecker presence and distribution. The No Action alternative would maintain snag habitats across the entire fire-affected area. About 6,180 acres of suitable habitat exists. Species such as the black-backed and three-toed woodpeckers would rapidly colonize stand-replacement burns within 1 to 2 years of the fire; however, within 5 years they would decline, presumably due to declines in bark and wood-boring beetles (Kotliar et al. 2002). For other species, such as the Lewis' woodpecker, northern flicker and hairy woodpecker, suitable habitat conditions will persist longer, upwards of 25 to 30 years. Once the majority of snags fall, cavity excavators would not likely occupy the area, or they would exist at greatly reduced levels.

Alternatives 1 and 5 support most primary cavity excavators at the 30% to 50% tolerance level or better. Alternatives 2 and 4 support most primary cavity excavators at the 30% to 50% level. Alternative 3 would reduce snag densities for much of the area down to the 30% tolerance level, although still provides for snag levels up to the 80% tolerance level. Therefore, Alternatives 1 and 5 provide the most habitat for these species, followed by Alternative 4, and then Alternative 3. Alternative 2 reduces the most habitat, and is the least favorable to dead wood associated species.

Another way to compare alternatives is to review the number of acres of suitable habitat protected, either in "reserve patches" specifically established for woodpecker species or non-salvage areas established for other reasons, e.g., RHCA protection or low economic viability. These unlogged patches are particularly important to species such as the black-backed and three-toed woodpeckers that may use unlogged burn areas as source habitats to maintain populations across the landscape. Table TW-16 summarizes untreated areas by alternative. Alternatives 1 and 5 essentially retain all existing habitat, about 4,759 acres (82% of forested acres), although Alternative 5 degrades the habitat slightly by treating trees 7 inches DBH and less. Alternatives 2 and 4 set aside approximately 2,701 acres (46%) and 3,536 acres (61%), respectively. Alternative 3 establishes 5 black-backed/three-toed woodpecker areas, helping provide important source habitat for these species, along with other acres not planned for harvest leaves 3,139 acres (54%).

Alternative 3, in general, provides better habitat for black-backed and three-toed woodpeckers due to the high densities of snags remaining. The designated snag retention areas provide the high densities of snags in large patches that these species need (Saab and Dudley, 1997;

Hutto, 1995; Sallabanks, 1995). These species can also utilize a burned area sooner than others because of their ability to utilize hard snags. While Alternative 4 has a higher number of unharvested acres, the additional acres would not have high snag densities, these acres were dropped from harvest due to lack of sufficient numbers of snags to meet the 13 snags per acre retention and provide harvestable material. Alternative 2 harvests more acres than the other alternatives reducing the amount of high density snag areas more than alternatives 2 and 4.

While snags are abundant after a fire, once they fall down, they will not be available again until a new forest develops, trees reach sizes useful for woodpeckers, and these trees begin to die. The period when snags are not available can be referred to as the "snag gap." Although snag levels currently exceed Forest Plan standards, it is expected that most post-burn snags will be on the ground within 30 years. The time it takes to reforest burn areas differs between natural regeneration and planting. Natural regeneration can delay reforestation by 10 to 50 years depending on the availability of a live tree seed source. The No Action Alternative relies on natural regeneration; Alternatives 2 –5 primarily use planting. In severely burned area, the No Action creates a snag gap of 70 years. Alternatives 2 and 3 create a snag gap of 75 years, greater than the No Action alternative. In Alternatives 2 and 3, so few snags are left during salvage logging that the snag gap would materialize at year 15 instead of year 30. Alternatives 4 and 5 create snag gaps of 60 years. If larger snags persist longer than expected, the snag gaps would be reduced further, particularly for Alternatives 1 and 5, which retain the most large diameter snags.

Existing Condition - Northern Goshawk

The northern goshawk inhabits conifer-dominated forests. Goshawks utilize a wide range of forest structural conditions, often hunting prey in more open stands, yet relying on mature to old growth structure for nesting and fledging. Nests are commonly on north aspects in drainages with dense canopy (60-80%), in large trees, and near water or other "edges."

One goshawk territory existed within the fire perimeter prior to the fire, on the west slope above Clear Creek near the northern boundary of the fire. The PFA (post-fledging area) was comprised of one-third in DOG #364 and the rest took in three adjacent stands down to Clear Creek. The vegetation severity in this area was mostly severe, with a small portion of the northern end being of moderate severity, and partial in the Clear Creek riparian zone. The partial burn in the riparian zone was mostly on the east side of the creek and a strip approximatley 100' wide on the west side of the creek This PFA no longer provides a large enough area of suitable habitat for goshawks. The portions that burned with moderate severity are not likely to provide the canopy closure needed in a nesting territory. A survey of this PFA in June of 2004 yielded no responses from goshawks. The fire burned through the territory with vegetation severity ranging from, to severe (greater than 90% tree mortality).

Just to the north and west of the PFA, immediately to the west of Unit-20A is a historic nesting area. Nesting was observed here several times in the past, the last known to occur in this area in 1995. The fire burned through this area with moderate severity; mostly underburned with some loss of canopy closure. This area will still provide nesting opportunities for goshawks especially when the understory is more fully recovered, and canopy closure increases. Surveys were conducted here in June 2004, no nesting goshawks were found; an old nest was found, but not likely used within the past few years.

Post-fire, it is highly unlikely that goshawks would use most of the interior portion of the fire area for nesting, as forested stands with 60 to 80 percent canopy cover and suitable trees no longer exist. It is likely that goshawks will forage in the open areas of the burn area. Fires typically improve foraging habitat for raptors by reducing hiding cover and exposing prey populations (Smith 2000).

Environmental Consequences - Northern Goshawk

(Consult the Old Growth Section of this Chapter for additional effects on goshawks and their preferred nesting habitat).

Direct and Indirect Effects

Alternative 1

There would be no direct adverse effects to goshawks from Alternative 1 because no salvage logging or fuels reduction activities would occur. Reforestation of the area would be dependent on natural regeneration, which would delay development of future forest including mature and old growth forest. (see Old Growth section for the time it would take to reestablish old growth). Because goshawks will prey on primary cavity excavator species, retention of dead wood habits will help improve goshawk foraging habitat. Lack of fuels treatment under this alternative would create a high risk for an intense reburn of the area; such a fire could further delay development of nesting habitat.

Alternatives 2, 3, 4, and 5

None of these alternatives propose management activities within the original goshawk post-fledging area. There are two proposed units (18 and 20A) in alternatives 2, 3, and 4 in the vicinity of the historic nest sites. The harvest of these two units will not affect the suitability of the nesting area. Alternative 5 proposes no salvage harvest, but does propose planting of severely burned areas and fules reduction activities. Some live trees would be removed for road construction, helicopter landings, and to reduce safety hazards, but effects would be considered negligible. The alternatives would positively affect northern goshawk habitat by accelerating reforestation so that stands would become mature sooner than if no action was taken (see Old Growth section for the time it would take to reestablish old growth).

Although the fire destroyed much of the PFA within the burn area, the historic nesting area could be suitable for nesting within 5-10 years. The historic nesting area should be monitored in the Spring of 2005, if units 18 and 20A have not been harvested by then. Should nesting occur, operations in the two nearby units, and helilanding #10 could disturb the nesting birds and cause failure of the nesting attempt. Restrictions on harvest activities (falling, yarding) would need to be imposed on units 18 and 20A, and the use of helilanding #10. Haul on Rd 2600036 would not be restricted; use of this road for haul should not disturb nesting activities due to the relatively high use of this road.

Because goshawks will prey on primary excavator species, retention of dead wood habits will help improve goshawk foraging habitat. Alternatives 2, 3, and 4 would support differing numbers of primary cavity excavators depending on the number of snags retained (see Primary Cavity Excavator section of this chapter). Alternative 2 would meet Forest Plan standards by retaining 2.39 snags per acre (see Primary Cavity Excavator section). Alternative 4 would exceed Forest Plan standards by retaining at least 13 snags per acre.

Alternative 3 would retain large snag patches and sufficient numbers of snags within harvest units to meet Forest Plan required levels of down wood. Adult goshawks foraging in the area are not likely to be disturbed by project activities. Foraging habitat is not limiting in this area, the lack of nesting habitat due to the fire is more limiting.

Under Alternatives 3 and 4 some burn areas are left untreated, but salvage logging and fuels reductions reduce overall fuel loads and break up the continuity of fuels remaining.

Cumulative Effects - All Alternatives

All of the activities listed in "Past, Present, and Reasonably Foreseeable Actions" (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on northern goshawks or their habitat. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Nesting habitat is typically the limiting factor for goshawks. Past timber harvest reduced mature and old growth habitat preferred for nesting and fledging. Since 1993, the Forest Plan as amended, has directed the Malheur National Forest to conduct timber sales in a manner that moves stands towards OFMS and OFSS structural stages, and timber sales planned since that time should not have contributed to loss of mature and old growth forest.

Additional restoration activities are being planned for the burn area and include hardwood and conifer planting in riparian areas. The scale of these projects relative to salvage logging is incidental. No nesting habitat would be affected. When the alternatives in this proposal are combined with these restoration projects, effects on northern goshawk would still be considered minimal.

Forage is not considered a factor limiting goshawk population viability, and consequently cumulative changes to foraging habitat, whether positive or negative, would not contribute to a measurable change in goshawk populations.

Although future timber management activities have yet to be proposed for the unburned areas of the affected subwatersheds, any management would be expected to continue under current or similar management direction that protects existing old growth and manages for future old growth.

Goshawks are highly sensitive to disturbance during the breeding season. When seasonal restrictions on management activities were disregarded in the past, breeding success may have been reduced. Since 1990, seasonal restrictions on activities have been regularly used in the vicinity of occupied nests.

In the short-term, the three alternatives that propose salvage harvest would not contribute to cumulative losses of mature and old growth habitat because stands treated no longer function as old growth. In the long-term, alternatives 2, 3, 4, and 5 would contribute positively to cumulative effects by accelerating the development of old growth, i.e. goshawk nesting habitat. Cumulatively, management actions are not expected to reduce population viability.

Northern Goshawk Summary

None of the Alternatives are expected to affect populations or viability of northern goshawks. The Easy Fire already reduced or eliminated nesting habitat in the three existing post-fledging areas. Alternatives harvest few live trees; no additional nesting habitat will be degraded.

Removal of dead and dying trees would reduce snag habitat used by goshawk prey, but forage is not considered a limiting factor for goshawks. If new nest sites are identified within or immediately adjacent to the project area, seasonal restrictions on management activities would be used to avoid disturbing goshawks during the breeding season.

By planting trees, Aternatives 2,3,4 and 5 would accelerate recovery of vegetation; in severely burned areas, development of nesting habitat could take 10 to 40 acres less than under the No Action Alternative.

The historic nesting area should be monitored in the Spring of 2005, if units 18 and 20A have not been harvested by then. Should nesting occur, operations in the two nearby units, and helilanding #10 could disturb the nesting birds and cause failure of the nesting attempt. Restrictions on harvest activities (falling, yarding) would need to be imposed on units 18 and 20A, and the use of helilanding #10. Haul on Rd 2600036 would not be restricted; use of this road for haul should not disturb nesting activities due to the relatively high use of this road.

Under Alternative 1, the elevated fuel loads expected in 10 to 20 years increase the risk of an intense re-burn; another stand replacement fire could further delay development of nesting habitat. Alternatives 2, 3, 4, and 5 also leave some burn areas untreated, but salvage logging and fuels reductions reduce overall fuel loads and break up the continuity of fuels remaining.

Existing Condition - Blue Grouse

Blue grouse inhabit coniferous forests intermixed with grassy or scabby openings. They use large mistletoe infected Douglas-fir trees, generally located within the upper 1/3 of slopes, as winter roosts. Pre-fire, blue grouse likely inhabited the project. Post-fire, there is little or no habitat within the burn area considered suitable for winter roost habitats; however, nesting habitat will be available once a variety of grasses and forbs becomes established and provide hiding cover.

Environmental Consequences - Blue Grouse

Direct and Indirect Effects

Alternative 1

Relying on natural regeneration to reforest the burn area would increase the amount of time (150-200 years) it would take mature and old growth trees to develop in the areas that burned with moderate to severe vegetation severity. The light to partially burned areas should develop into old growth in about 50 years. Blue grouse favor mature/over-mature trees as winter roosts. Since fuels would not be treated under Alternative 1, there is the high risk of an intense re-burn that could delay recovery of vegetation.

Alternatives 2, 3, 4, and 5

Direct effects of salvage logging and fuels reduction would be disturbance to blue grouse nesting/foraging in the project area, forcing them out of activity areas and into adjacent undisturbed areas. Indirect effects to blue grouse could be increased competition for nesting/foraging habitat outside the burn area. It is assumed that salvage logging and fuels reduction activities will have minimal effects on blue grouse, as there is little habitat favored by blue grouse remaining within the burn area. Ground vegetation for nesting/foraging is expected to recover rapidly. Grasses and forbs are expected to reestablish naturally in 2 to 5 years; shrubs are expected to reestablish in 2 to 15 years. Blue grouse favor mature/over-mature trees as winter roosts; planting trees would reduce the amount of time it would take for the moderate and severely burned areas to develop into old growth.

Cumulative Effects - All Alternatives

All of the activities listed in “Past, Present, and Reasonably Foreseeable Actions” (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on old growth and associated species. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Cumulatively, where livestock grazing coincides with nesting/foraging, grazing would likely reduce height of ground vegetation and possibly degrade nesting/foraging habitat. Reintroduction of livestock grazing is to be delayed at least 2 growing seasons post-fire to allow recovery of vegetation. The alternatives under this proposal contribute minimal adverse effects to ground vegetation recovery.

Summary

None of the alternatives are expected to affect populations or viability of blue grouse.

Existing Condition - Threatened or Endangered Species – Bald Eagle

Bald eagle nests are usually in multistoried, predominantly coniferous stands with old growth components near water bodies that support adequate food supply (U.S. Dept. Interior 1986). The nearest known nest site is approximately 40 miles south in the Silvies Valley. This site has been monitored since 1991; young were produced in 8 of 11 years.

On the Malheur National Forest, bald eagles congregate at winter roost sites during the late fall, winter, and early spring. The eagles roost and feed in Bear Valley, and along the South Fork John Day River, Middle Fork John Day River, and the main John Day River. They scavenge in agricultural valleys and wetlands, feeding primarily on carrion normally found in areas of cattle concentration and birthing, or where ranchers dispose of dead animals. They roost at night in mature forest stands, which provide a microclimate that helps protect them from cold weather and wind. Eagles typically arrive in early November and depart about the end of April; however, bald eagles have been reported in every month, but not during all months within any one year.

No winter roost sites are within the project area. The Easy fire reduced old growth, and therefore, reduces potential roost trees, but again, even prior to the fire, the Easy Fire area did not have any roost sites.

Environmental Consequences - Threatened or Endangered Species – Bald Eagle

Direct, Indirect and Cumulative Effects

All Alternatives

The project area and adjacent lands are not used by bald eagles for nesting or winter roosting. This area may get minor use briefly by migrating birds. Therefore, there will be no direct, indirect, or cumulative effects from any of the alternatives for this project on nesting or roosting bald eagles, or their habitat.

Determination

There would be **NO EFFECT (NE)** to bald eagles or their habitat under any of the alternatives. No bald eagles nest or roost within the project area.

Existing Condition - Threatened or Endangered Species – Gray Wolf

Historically, wolves occupied all habitats on this Forest (Wisdom et al. 2000), but are currently considered extirpated. Today, the Malheur, Wallowa-Whitman and Umatilla National Forests are probably suitable habitats for wolves. In 1999, a collared wolf from the experimental, non-essential Idaho population traveled to the three Blue Mountain National Forests and stayed until it was captured and returned to Idaho. Another wolf was found dead near Baker City in the spring of 2000. Over time, wolves dispersing from the Idaho wolf population could return to the Blue Mountains and establish packs.

Environmental Consequences - Threatened or Endangered Species – Gray Wolf

Direct, Indirect and Cumulative Effects, and Determination - All Alternatives

Wolves are limited by prey availability and are threatened by negative interactions with humans. Generally, land management activities are compatible with wolf protection and recovery, especially actions that manage ungulate populations. Habitat and disturbance effects are of concern in denning and rendezvous areas. No such habitat is currently occupied in Oregon.

Determination

At this time, the determination for almost all project activities on the Malheur National Forest is **NO EFFECT (NE)** for the following reasons:

- No populations currently occupy the Malheur National Forest.
- No denning or rendezvous sites have been identified on the Malheur National Forest.
- There is an abundance of prey on the Forest; therefore prey availability is not a limiting factor.

Existing Condition - Threatened or Endangered Species – Canada Lynx

Potential lynx habitat on the Malheur National Forest is defined as stands above 5,000 feet that are subalpine fir, lodgepole pine, Engelmann spruce, or moist grand fir types. Lynx require a mix of early and late seral habitats to meet their food and cover needs. Early seral habitats provide the lynx with a prey base, primarily snowshoe hares, while mature forests provide denning space and hiding cover (Koehler 1990). Pockets of dense forest must be interspersed with prey. Lynx den sites are in forests with a high density of downfall (Koehler 1990). Favored travel ways within and between habitat areas include riparian corridors, forested ridges, and saddles. Although there are several unconfirmed sightings of lynx in Grant County, there is no indication that lynx occurs in the project area.

Research indicates that lynx need approximately 10 to 15 square miles of high quality habitat to support a functional home range (Ruggiero et al. 1994). The four subwatersheds affected by the Easy fire contain very little lynx habitat. No subalpine fir, Engelmann spruce or moist mixed conifer forest exists. About 850 acres, or 3% of the subwatershed acres, are in lodgepole and grand fir forest types that would classify as habitat. Within the burn area, 280 acres, or 4% of the burn area, are in lodgepole pine that would classify as habitat; the fire burned through these areas. Forest managers have conducted several mapping analyses of lynx habitat on the Malheur National Forest; none of these analyses classified the Easy project as a Lynx Analysis Unit (LAU). The number of acres is considered insufficient for lynx and what does exist is noncontiguous; therefore, this area is not considered suitable habitat for lynx to occupy. The nearest area that approximates lynx source habitat is located in the Monument Rock Wilderness, about 10 miles to the southeast.

In general, the project area is relatively dry, with mostly ponderosa pine dominated stands. Mixed conifer, high canopy closure stands with grand fir did exist prior to the fire, but they comprised only a smaller portion of the area and are still relatively dry sites. Historically, under natural fire regimes, the area was probably even more dominated by open, ponderosa pine stands than it is today, so it is not as if site potential would be conducive to historical lynx habitat.

Environmental Consequences - Threatened or Endangered Species – Canada Lynx

Direct, Indirect Effect and Cumulative Effects - All Alternatives

Because lynx habitat is so limited in the project area, both now and historically, there would be no direct, indirect or cumulative effects expected from any of the alternatives. It is very unlikely that lynx would use the project area due to the lack of habitat.

The fire has already eliminated connectivity through the area. Activities planned in this EIS will not further impact it.

Effects Determination

Project actions would have no effect on Canada lynx or their habitat; therefore, the call is **No Effect (NE)**.

Existing Condition - Sensitive Species - Wolverine

Wolverines were always rare in Oregon, although recent sightings, tracks, and collected remains document their continued presence at low densities in the state (Csuti et al. 1997). Current distribution appears to be restricted to isolated wilderness areas. Verts and Carraway (1998) believe that while there is a possibility of self-maintaining population of wolverine in the state, most animals seen or collected are likely dispersers from Washington and Idaho populations. Confirmed observations on the Malheur National Forest are from the Strawberry Mountain Wilderness and include a partial skeleton found in 1992 and tracks and a probable denning site found in 1997. Additional sightings of animals and tracks have occurred on the District, but none have been confirmed.

The likelihood of wolverine using or frequenting the area is expected to be very low. Source habitat is essentially non-existent in the project area. There are no subalpine forest types with or without talus surrounded by trees in or adjacent to this area. The Easy fire severely or moderately burned 5,550 acres of forested ground (90% of the forested acres), eliminating the contiguous forested conditions favored by wolverine. The nearest areas that approximate wolverine source habitat are Dixie Butte and Indian Rock approximately 10 miles to the northwest and respectively.

Foraging and dispersal habitat for wolverine occurs throughout the Blue Mountain Ranger District. Wolverines could possibly use any area of the District to satisfy life needs; however, areas of high deer and elk concentrations, low human impacts, low human disturbance, and potential denning sites that appear to be home range requirements are limited.

The project area may provide some marginal foraging and dispersal habitat for wolverines, but it is assumed that high levels of human disturbance (management activities, firewood cutting, and recreational use) and development (primarily high road densities) make most of this area unsuitable for wolverine for summer foraging habitat. Winter foraging habitat is limited because elevations in the Easy area are above those typically associated with big game winter range. In addition, the Easy fire reduced habitats for many mammal species by destroying much of the cover, both vegetation and down logs. Post-fire, the loss of cover further reduces area use by wolverine and its prey species.

Connectivity Habitat

The connectivity corridor that occurred through the center of the fire experienced moderate to high vegetation severity; resulting in a substantial gap in the corridor. The riparian area of Clear Creek is maintaining some connectivity through the fire area. Salvage harvest is being excluded from all RHCAs. Because a minimum width of 400 feet is considered adequate for travel habitat, connectivity corridors along Middle Fork John Day River, Lower Idaho Creek, Clear Creek, and portions of Bridge Creek are considered adequate.

From a landscape perspective, the loss of the corridor in the Easy area should not significantly reduce the effectiveness of the connectivity that potentially links suitable areas in the northern Blue Mountains, Wallowa Mountains, and the northern Rocky Mountain province in general with potential habitat to the west in the Ochocos and Oregon Cascades.

Environmental Consequences - Sensitive Species - Wolverine

Direct and Indirect Effects - Alternative 1 - No Action

The No Action alternative would have no direct effects to wolverine or potential habitat. Indirect effects result from potential changes in habitat for wolverine prey. By relying on natural regeneration for reforestation, recovery of trees would be slower than under a planting scenario. See the Easy Fire Recovery wildlife report for discussion of the effects of the alternatives on big game habitat. Effects to rodent foraging habitat is expected to be the same as the effects to big game foraging habitat as these animals feed on many of the same plants as deer and elk do.

The risk of an intense reburn in the project area is high with this alternative, although risks do not increase for 10 to 20 years, the time expected for snags to fall to the ground and elevate fuel loads. Another stand replacement fire would delay recovery of cover vegetation for dispersal or movement.

Cumulative Effects - Alternative 1 - No Action

All of the activities listed in "Past, Present, and Reasonably Foreseeable Actions" (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on wolverine. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Past adverse effects on wolverine foraging and dispersal habitat have been primarily a result of timber harvest and road construction; the project area has been a relatively highly managed area. In burned riparian areas, hardwood and conifer planting is being planned under separate NEPA documents. Cumulatively, restoration activities would improve habitat for wolverine prey species. Livestock grazing would be delayed for at least two years post-burn to allow for recovery of ground cover.

Reforestation is required where commercial timber harvest has occurred and the land is left under-stocked. Planting in the fire area will include: salvage harvest areas, burned riparian areas, and burned plantations. Planting of most of the plantations is being done under existing NEPA. Planting should accelerate the development of forest 20-50 years faster than what will occur under the 'No Action' Alternative. The No Action alternative would not immediately contribute any adverse cumulative effects to wolverine prey or their habitats. Elevated fuel loads expected in 10 to 20 years increase the risk of an intense re-burn; another stand replacement fire could further delay development of cover for wolverine and its prey. Alternatives 2 and 3 also leave some burn areas untreated, but salvage logging and fuels reductions would reduce fuel loads overall and break up the continuity of fuels remaining.

Determination

Due to the nature of the No Action alternative, there would be **NO IMPACT (NI)** to wolverine.

Direct and Indirect Effects - Alternatives 2, 3, 4, and 5

There are no confirmed records of this species occurring in the project area; therefore, there would be no direct effect to this species.

Indirect effects to wolverine, and its preferred habitat, would be minimal, regardless of the alternative. Post-fire, the project area is considered unfavorable for wolverine occupation. Human disturbance related to proposed salvage activities might displace transient or dispersing wolverine from potential foraging habitat during the duration of the project. Post-salvage road closures would help reduce the level of human disturbances as habitat conditions become more favorable to prey species. Areas of high ungulate density, and especially winter range, are probably key in identifying suitable wolverine foraging habitat (Witmer et al. 1998). Management recommendations by Banci (1994) suggest that management activities should incorporate strategies that improve the ungulate forage base for wolverine, without significantly changing vegetation structure. These alternatives would improve big game habitat; planting of trees would accelerate recovery of hiding and thermal cover. The Easy Fire Recovery wildlife report discusses effects of the alternatives to big game habitat. Effects to rodent foraging habitat is expected to be the same as the effects to big game foraging habitat as these animals feed on many of the same plants as deer and elk do.

Salvage logging reduces the future build-up of down logs that could impede big game movements and elevate risk of a future re-burn. Alternative 2 salvage logs the most acres 1,777 acres), followed by Alternative 3 (1,298 acres), and Alternative 4 (956 acres).

Alternative 5 proposes no commercial salvage harvest, fuels reduction treatments would occur removing material <7”dbh. Planting will occur on 2,524 acres that were severely burned. Planting should speed up the development of forest stands by 20 – 50 years; providing travel corridors sooner than Alternative 1. Road closures that would occur under Alternatives 2-4 will also occur with Alternative 5; reduction in road densities will reduce the impacts from human disturbance.

Table WL-19: Open Road Densities

Alternative	Open Road Density (miles per square mile)
Forest Plan Standard	3.2
Bridge Creek	
Existing	3.7
Alt. 1	3.5
Alt.’s 2, 3, 4 and 5	3.5
Clear Creek	
Existing	4.2
Alt. 1	3.0
Alt.’s 2, 3, 4 and 5	2.8
Reynolds Creek	
Existing	2.9
Alt. 1	2.0
Alt.’s 2, 3, 4 and 5	2.0

Cumulative Effects - Alternatives 2, 3, 4, and 5

All of the activities listed in "Past, Present, and Reasonably Foreseeable Actions" (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on wolverine. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Past adverse effects on wolverine foraging and dispersal habitat have been primarily a result of timber harvest and road construction; the project area has been relatively highly managed. In burned riparian areas, hardwood and conifer planting is being planned under separate NEPA documents. Cumulatively, restoration activities would improve habitat for wolverine prey species. Livestock grazing would be delayed for at least two years post-burn to allow for recovery of ground cover. Reforestation is required where commercial timber harvest has occurred and the land is left under-stocked. Some conifer trees were planted during the spring of 2003.

Reconstruction of Highway 26 in the area between Austin Junction and Blue Mountain Summit is in progress by the Oregon Department of Transportation. The highway is being widened and some habitat will be removed. A wider highway increases the likelihood that an animal could be killed by collision with a vehicle or that movement patterns could be disrupted. The Easy project has the potential, especially in conjunction with the highway project and from the effects of past timber harvest, to effect wolverine movement and dispersal.

Alternatives 2 – 5 would not immediately contribute any adverse cumulative effects to wolverine prey or their habitats. Under Alternative 4 and 5, the elevated fuel loads expected in 10 to 20 years increase the risk of an intense re-burn; another stand replacement fire could further delay development of cover. Alternatives 2 and 3 also leave some burned areas untreated, but salvage logging and fuels reductions reduce fuel loads overall and break up the continuity of fuels remaining.

Alternatives 2 – 5 would contribute positively to cumulative effects by accelerating the development of hiding cover and thermal cover.

Determination

All Alternatives **may impact individuals or habita**t, **but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population (MIIH**). Human disturbance related to proposed salvage activities could have short-term, indirect effects on wolverines, although the risk of disturbance to wolverines is considered low. Wolverines are considered transient based upon their large home ranges. None of the treatment areas include denning habitat. Following management activities, road closures would reduce motorized access to the benefit of wolverines. None of the alternatives will affect wolverine habitat or species viability because the principal big game prey base is expected to remain stable or increase. Wolverines also prey on birds and small mammals. During the first 10 – 15 years post-fire grasses and shrubs will dominate the landscape, seed and berry eating birds, and rodent populations are expected to increase. These increased bird and rodent populations may provide a larger prey base for wolverines, reducing the amount of energy expended searching for prey.

Existing Condition - Sensitive Species - Pacific fisher

Authorship and citation for the following baseline data, unless indicated otherwise, is taken from http://www.livingbasin.com/cbasin/endangered/fisher.htm

Fishers are medium sized carnivores that prey on a wide variety of foods including birds, rabbits, porcupines, and carrion. Distribution is likely governed by the availability of food but the presence of overhead cover may also be an important factor. Home range sizes of fishers vary up to 30 km^2 (about 7,400 acres) for adult males. The range of one male will overlap those of more than one female, but home ranges within adult sexes are exclusive.

Fishers are found only in North America. Their current range is reduced from that which occurred prior to European settlement of the continent, but most of this reduction has occurred in the United States (Ruggiero et al. 1994). The Fisher's range is in forested areas of central and southern Canada, south in the east to Wisconsin, Minnesota, Michigan, New York, and New England. In the west, they range south into northern Idaho, western Montana, Oregon, Washington, and the Sierra Nevada in California (Marshall 1996).

In Oregon, their range is the coastal range, Klamath Mountains, Cascade Range, and east to the Blue Mountains, and Gearhart Mountain or farther. They occur, or are likely to occur, in Baker, Clackamas, Coos, Curry, Deschutes, Douglas, Jackson, Josephine, Klamath, Lake, Lane, Linn, Tillamook, Union, and Wallowa counties. They formerly occurred in all forested counties (Marshall 1996). Parts of the Malheur National Forest are delineated to be within the fisher's range in Grant County, Oregon, according to the map found in Csuti et al. (1997). Fishers were likely extirpated from eastern Oregon during the first half of the 20th century. In 1961 13 Fishers were translocated into the Wallowa Mountains near La Grande, the success of this effort is unknown (Aubrey and Lewis, 2002. There has not been a confirmed sighting of Fishers on the Malheur NF in recent years.

Fishers use primarily coniferous or mixed-wood habitats. Optimum Fisher habitat consists of a diversity of forest types and, therefore, greater prey abundance. Studies have shown a preference for forests dominated by multi-layered conifer stands, and in Idaho, they prefer mesic forest habitats (Witmer et al. 1998), but some hardwoods may be desirable for maximum prey numbers and diversity. A 70 to 80 percent canopy closure is believed optimum, but a California study showed a preference for 40 to 70 percent canopy cover areas.

Fishers are known to inhabit second growth and even clearcuts after cover is established (Marshall 1996). It is not known whether the second growth and sparse overhead canopy habitats are used transiently or the basis of stable home ranges (Ruggiero et al. 1994). Large diameter trees with cavities, especially riparian cottonwoods in British Columbia, are important as natal den sites. Fishers move to larger cavities as the young grow. Dense forest stands in the latter successional stages provide the best quality habitat, particularly in western North America. (Ruggiero et al. 1994) noted that fisher use riparian areas disproportionately more than their occurrence and exhibit a strong preference for habitats that have overhead tree cover.

In Ruggiero (1994) it has been hypothesized that the physical structure of the forest and prey associated with the structure are the critical features that explain fisher habitat use, not specific forest types. Forest structure needs to provide three important functions for fisher usage: 1) lead to a high diversity of dense prey populations, 2) lead to high vulnerability of prey to fisher, and 3) provide natal and maternal dens and resting sites.

Fishers are vulnerable to habitat loss through forestry, conversion of forests to other land uses, and hydroelectric development. Also contributing to the reduction and extirpation of Fisher populations are over-trapping and the widespread use of poisons as a harvest and predator control method. Forest harvesting elsewhere also increases access for trappers, which is a particular concern because fishers are taken in marten sets. Marshall (1996) states that timber harvesting is not considered compatible with maintenance of maximum fisher numbers in most areas; and if severe, it will eliminate fishers. Degraded, destroyed, or fragmented habitat may result in isolated habitats that are too small to maintain viable fisher populations.

Environmental Baseline
Although only a small amount of habitat survived within the fire area there is suitable habitat adjacent. Some small portions of the older stands were only lightly or partially burned. Fisher are not known or suspected to occur in the fire area or adjacent to it. Fishers have been extirpated from much of their range due to trapping and loss of habitat due to logging (http://imnh.isu.edu/digitalatlas/splash_navigate/pcmain.htm). They are considered extirpated from Oregon (Oregon Natural Heritage Program 2001).

Conifer stands that have at least 40% canopy closure and were in the lodgepole pine, cool moist or warm dry biophysical environments were considered fisher habitat. Stand structure and availability of prey species appear to be more important than stand composition. Fishers seem to be opportunists in regards to habitat use in regards to foraging. They are more restrictive in their selection of forest stands that they will utilize for denning and resting. Forested areas that had the potential to provide denning and resting habitat for fisher survived in only small amounts in the fire area (<1%). Stands that would provide habitat for their prey species survived on about 17% of the fire area (see vegetation section).

Connectivity Habitat
The connectivity corridor that occurred through the center of the fire experienced moderate to high vegetation severity; resulting in a substantial gap in the corridor. The riparian area of Clear Creek is maintaining some connectivity through the fire area. Salvage harvest is being excluded from all RHCAs. Because a minimum width of 400 feet is considered adequate for travel habitat, connectivity corridors along Middle Fork John Day River, Lower Idaho Creek, Clear Creek, and portions of Bridge Creek are considered adequate.

From a landscape perspective, the loss of the corridor in the Easy area should not significantly reduce the effectiveness of the connectivity that potentially links suitable areas in the northern Blue Mountains, Wallowa Mountains, and the northern Rocky Mountain province in general with potential habitat to the west in the Ochocos and Oregon Cascades.

Environmental Consequences- Sensitive Species - Pacific fisher

Alternative 1

The No Action alternative proposes no harvest of dead and dying trees, no planting of burned stands or riparian areas, no construction or reconstruction of temporary spurs. The only activity that would occur would be replanting of burned plantations, or roadwork that is covered under existing NEPA.

Direct and Indirect Effects

Canopy closure will continue to increase in surviving stands that currently have canopy closure less than 40%. An estimated 1343 acres will develop at least 40% canopy closure in the next 5-10 years. Regeneration of stands will take an extra 20 - 50 years without the planting that would occur under Alternative 2,3,4 and 5.

Snags that were created by the fire will begin to fall immediately and by 10 – 30 years will all be on the ground. This will result in an increase in fuel loadings that will increase the risk of another severe fire event. Another severe fire event will likely burn what little potential fisher habitat remains in the area.

Cumulative Effects

All of the activities listed in "Past, Present, and Reasonably Foreseeable Actions" (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on fisher and its habitat. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Cumulative effects include past timber sales that reduced canopy closure in fisher habitat. The No Action Alternative will not contribute to the impacts of cumulative effects.

Planting in the fire area will include: salvage harvest areas, burned riparian areas, and burned plantations. Planting of most of the plantations is being done under existing NEPA. Planting should accelerate the development of forest 20-50 years faster than what will occur under the 'No Action' Alternative.

Determination of Impacts

The No Action Alternative will **Not Impact (NI)** fisher or their habitat.

Alternatives 2, 3, and 4

No changes to fisher habitat would occur from salvage harvest. Areas being salvaged no longer provide habitat suitable for fishers. The range of total acres proposed for harvest in low, moderate, and high vegetation severity burn is 956 – 1,777 acres.

Direct and Indirect Effects

Canopy closure will continue to increase in surviving stands that currently have canopy closure less than 40%. An estimated 1343 acres will develop at least 40% canopy closure in the next 5-10 years.

Snags that were created by the fire will begin to fall immediately and by 10 – 30 years most will be on the ground.

Cumulative Effects

All of the activities listed in "Past, Present, and Reasonably Foreseeable Actions" (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on old growth and associated species. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Cumulative effects include past timber harvest on approximately 7,000 acres of potentially suitable habitat. Only 500 of these acres have canopy closure considered necessary for fisher habitat and another 300 acres are expected to achieve 40% in the next 5-10 years. Harvest and precommercial thinning on 1,393 with this proposed action in addition to previous harvest will result in almost 7,900 acres of the 20,300 potentially suitable fisher habitat, or 39%, being unsuitable due to management activities.

Reconstruction of Highway 26 in area between Austin Junction and Blue Mountain Summit is in progress by the Oregon Department of Transportation. The highway is being widened and some habitat will be removed. A wider highway increases the likelihood that an animal could be killed by collision with a vehicle or that movement patterns could be disrupted. The Easy project has the potential, especially in conjunction with the highway project and from the effects of past timber harvest, to effect fisher movement and dispersal.

Timber sales are likely to occur in the Galena watershed (east of the planning area) and in the Crawford subwatershed (north of the planning area). However, without a large-scale habitat assessment determining the status of fisher habitat components, the effects of cumulative actions are unknown.

Determination of Impacts

This alternative will **Not Impact (NI)** habitat, or impact individuals. These alternative will not impact habitat, and will not likely contribute toward federal listing or loss of viability to the population or species.

Alternative 5

Alternative 5 proposes no commercial salvage harvest, fuels reduction treatments would occur removing material <7"dbh. Planting will occur on 2,524 acres that were severely burned. Planting should speed up the development of forest stands by 20 – 50 years; providing travel corridors sooner than Alternative 1. Road closures that would occur under Alternatives 2-4 will also occur with Alternative 5; reduction in road densities will reduce the impacts from human disturbance.

Direct and Indirect Effects

Planting will directly affect the amount of time it will take the severely burned areas to regenerate, 20 – 50 years sooner than natural regeneration. Fuels treatment planned under this alternative will remove material <7"dbh on 3,652 acres. The fuels treatment will not impact the overstory that may remain in some of the treatment areas and should reduce the potential for a reburn that could further impact the area.

Cumulative Effects

All of the activities listed in "Past, Present, and Reasonably Foreseeable Actions" (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on fisher and their habitat. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Cumulative effects include past timber harvest on approximately 7,000 acres of potentially suitable habitat. Only 500 of these acres have canopy closure considered necessary for fisher habitat and another 300 acres are expected to achieve 40% in the next 5-10 years. Harvest and precommercial thinning on 1,393 with this proposed action in addition to previous harvest will result in almost 7,900 acres of the 20,300 potentially suitable fisher habitat, or 39%, being unsuitable due to management activities.

Reconstruction of Highway 26 in area between Austin Junction and Blue Mountain Summit is in progress by the Oregon Department of Transportation. The highway is being widened and some habitat will be removed. A wider highway increases the likelihood that an animal could be killed by collision with a vehicle or that movement patterns could be disrupted. The Easy project has the potential, especially in conjunction with the highway project and from the effects of past timber harvest, to effect fisher movement and dispersal.

Timber sales are likely to occur in the Galena watershed (north of the planning area) and in the Crawford subwatershed (north of the planning area). However, without a large-scale habitat assessment determining the status of fisher habitat components, the effects of cumulative actions are unknown.

Determination of Impacts

This alternative will **Not Impact (NI)** habitat, or individuals. Because fishers have been extirpated from Oregon, Alternative 5 will not contribute to the loss of species viability or contribute to federal listing. This alternative will not impact habitat, and will not likely contribute toward federal listing or loss of viability to the population or species.

Existing Condition - Sensitive Species - Columbia Spotted Frog

Great Basin populations have been adversely affected by habitat degradation resulting from mining, livestock grazing, road construction, agriculture, and direct predation by bullfrogs and non-native fishes (NatureServe 2002). Spotted frogs are moderately impacted range-wide; its habitat lends itself to alternate uses (agriculture, development, road construction). They are fairly resistant and tolerant of nondestructive intrusion.

Recent intensive surveys indicate severe declines in the Great Basin populations. Declining populations in the Great Basin could be indicative of declines in the populations in the Interior Columbia River Basin. Similar threats to habitat occur in the Interior Columbia Basin as in the Great Basin. These threats to spotted frog habitat include agriculture, development, and road construction.

Spotted frogs are highly aquatic and are rarely found far from permanent water. Breeding habitat is usually in shallow water in ponds or other quiet waters along streams. Breeding may also occur in flooded areas adjacent to streams and ponds. Adults may disperse overland in the spring and summer after breeding.

This species occurs in extreme southeastern Alaska, southwestern Yukon, northern British Columbia, and western Alberta south through Washington east of the Cascades, eastern Oregon, Idaho, and western Montana to Nevada (disjunct, Mary's, Reese, and Owyhee river systems), southwestern Idaho (disjunct), Utah (disjunct, Wasatch Mountains and west desert), and western and north-central (disjunct) Wyoming. Disjunct populations occur on isolated mountains and in arid-land springs.

In Oregon, the Columbia spotted frog appears to be widely distributed east of the Cascade Mountains. This species is believed to be present in all subbasins on the Malheur National Forest. It is assumed widely distributed in the project area. No surveys specific for spotted frogs have been conducted in the Easy Fire area. Clear Creek and Easy Creek have the potential to support populations of these frogs.

No habitat surveys have been conducted specifically for spotted frog; however, habitat probably exists along most perennial and some intermittent streams. Habitat has been degraded by past management activities, such as livestock grazing, road construction and maintenance along streams, and timber harvest adjacent to streams, springs, and marshes. Most of these management activities (timber harvest, road construction and maintenance) that would have degraded frog habitat in the past are now conducted in such a way as to minimize impacts. It is unknown what effects the Easy fire had on individual animals. Fire severity in riparian areas was variable. Generally, the fire killed most of the trees in the riparian uplands while leaving shrubs, forbs and grasses in the floodplains untouched or spot-burned due to the high moisture content of this ground vegetation. Along Clear Creek several small segments of the riparian zone were severely burned with nearly all vegetation being killed. The RHCA for Easy Creek burned with high vegetation severity along the first 0.8 miles of the creek below Rd 142; the next 0.4 miles to the fire perimeter burned with low vegetation severity.

Environmental Consequences - Sensitive Species - Columbia Spotted Frog

Alternative 1

The No Action alternative proposes no harvest of dead and dying trees, no planting of burned stands or riparian areas, no construction or reconstruction of temporary spurs. The only activity that would occur would be replanting of burned plantations, or roadwork that is covered under existing NEPA.

Direct and Indirect Effects

Habitat requirements for spotted frogs are limited, but it is assumed that if healthy stream channels and riparian vegetation are maintained, then population viability will be maintained. Under the No Action alternative, there would be no new management activities; therefore, there would be no direct effects to spotted frogs or their habitat. Although the fire killed most of the conifer overstory, the expected flush of ground vegetation, particularly shrub species, may elevate the amount and distribution of riparian hardwoods to levels higher than existed prior to the fire. Grasses and forbs are expected to reestablish naturally in 2 to 5 years; shrubs are expected to reestablish in 2 to 15 years.

Riparian vegetation likely provides cover for frogs and habitat for insects that frogs may feed on. The Easy fire created many snags that will be available for recruitment into project area streams in the future, down logs can help stabilize stream channels and create pools for frogs. Most of the smaller snags (~10-14" dbh) will fall within the first 10 years post-burn, as well as some of the larger snags. Nearly all snags will be on the ground within 30 years.

The No Action alternative would do nothing to reduce impacts of the existing road system. It would be expected that sedimentation from existing roads would increase over time, unless other projects are implemented to address these impacts. Sediment from roads or runoff from severely burned slopes would reduce water quality, potentially smother eggs, or fill in slower moving stretches of streams or pools.

Cumulative Effects

All of the activities listed in "Past, Present, and Reasonably Foreseeable Actions" (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on spotted frogs and their habitat. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Road construction, roads, timber harvest and grazing activities on private and public land have reduced spotted frog habitat quality and complexity in and adjacent to project area streams.

The No Action alternative would not contribute to further degradation of riparian areas. Projects are being planned simultaneously to plant riparian areas with hardwood species improving riparian vegetation. Livestock grazing has been discontinued in the burn area for a minimum of 2 to 3 years. Without fuels reduction there is an increased risk of a future fire event that would impact soils and vegetative cover; potentially increasing the sediment flows into streams. In the short-term, restoration activities could impact individuals or habitat. In the long-term, these actions will help reestablish riparian vegetation and stream integrity to the benefit of spotted frogs.

Determination

The No Action Alternative will **Not Impact (NI)** habitat, or individuals.

Alternatives 2, 3 and 4

Direct and Indirect Effects

Habitat requirements for spotted frogs are limited, but it is assumed that if healthy stream channels and riparian vegetation are maintained, then population viability will be maintained. Spotted frogs are fairly resistant and tolerant of nondestructive intrusion.

Salvage logging and fuels reduction activities should have minimal adverse effects to Columbia spotted frogs or their habitat. In the short term management activities could increase sediment inputs into streams that are potentially habitat for spotted frogs. After the first couple years the reestablishment of grasses and shrubs should stabilize the soils sufficiently to minimize sedimentation. Utilizing INFISH RHCA buffers along the streams should minimize the amount of sediment getting into the streams. There may be limited felling of hazard trees in RHCAs, but the trees would be left on site. It is unlikely that felling of hazard trees would kill spotted frogs, and effects to habitat would be considered minimal. Harvest and fuels treatment activities outside riparian areas are expected to have little to no indirect impacts on riparian and aquatic systems. Vegetation recovery and recruitment of snags in stream channels would be as described for Alternative 1, both considered beneficial to the riparian and aquatic system. The activities with the highest potential for affecting streams are road management activities, particularly those that directly affect riparian vegetation, floodplains, or stream channels.

Alternatives 2, 3, and 4 propose 0.7, 0.5, and 0.2 miles of temporary road construction respectively. The temporary road construction is for short spur roads to access harvest units. These temporary roads will be decommissioned after use. The temporary road construction is not within RHCAs. Road effects are typically magnified when activities occur within 100 feet of stream. Proposed road management actions such as culvert replacement or cleaning at stream crossings, or maintenance within 100 feet of streams would produce short-term (1-2 years) sediment into project area streams. These activities have the potential to adversely affect spotted frog habitat by increasing fine sediments in the short-term, although sediment may be less of a concern for frogs than fish species. The short-term increase in sediment would be very small in size and scale due to the small area of disturbance at each project point. Best management practices (BMPs) are incorporated into standard road maintenance practices and would reduce the probability and magnitude of the short-term risks. In the mid- to long-term, road maintenance would reduce the chronic sediment production of existing roads by removing ruts and rills from the driving surface, adding less erosive surfacing material, and improving drainage. Road decommissioning is designed to benefit riparian habitat and water quality in the mid- to long-term by improving filtration, restoring ground cover, reducing sediment yield and restoring floodplains.

Cumulative Effects

All of the activities listed in “Past, Present, and Reasonably Foreseeable Actions” (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on spotted frogs and their habitat. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Other ongoing projects in the Easy riparian areas are discussed under Alternative 1, cumulative effects. Alternatives 2, 3, and 4 would not contribute to further degradation of riparian areas. The road management activities associated with Alternatives 2, 3, and 4 is expected to contribute long-term benefits to the recovery of spotted frog habitat, more so than the No Action alternative, likely improving conditions beyond the pre-fire baseline. Riparian planting will have a beneficial effect for this species, speeding the recovery of vegetation in burned riparian areas.

Determination

In summary, Alternatives 2, 3, and 4 **May impact individuals or habitat, but would not likely contribute to a trend towards Federal listing or loss of viability to the population or species (MIIH).** The only short-term impacts to spotted frogs would be those from road maintenance or decommission activities that occur within 100 feet of streams; anticipated sediment impacts are expected to have a negligible effect to spotted frogs or populations. However, the long-term reduced impacts to riparian aquatic resources (also due to road management activities) would result in a **Beneficial Impact** for spotted frogs.

Alternative 5

Alternative 5 proposes no salvage harvest; but proposes planting severely burned areas (2,354 acres) and riparian areas (170 acres), closes Road 2600-391 year-round, replaces DOG/ROG 364 with a new DOG and ROG, and fuels treatment of dead and dying trees <7"dbh on 3,652 acres.

Direct and Indirect Effects

Habitat requirements for spotted frogs are limited, but it is assumed that if healthy stream channels and riparian vegetation are maintained, then population viability will be maintained. Spotted frogs are fairly resistant and tolerant of nondestructive intrusion.

Planting of severely burned areas without salvage harvest will reduce the potential for sediment to get into the streams. Planting in riparian reserves will help reduce sediment input into streams reducing the potential impact on these frogs as well as provide shade and cover to the streams keeping the water temperature lower.

Other activities related to this alternative would not impact these frogs or their habitat. The proposed fuels reduction should not increase sediment input and should reduce the risk of another large-scale severe fire. Closing Road 2600-391 may slightly decrease the potential for sediment input from the road. Other road maintenance activities planned under this EIS would occur. Construction of temporary roads would not occur under this alternative.

Cumulative Effects

All of the activities listed in "Past, Present, and Reasonably Foreseeable Actions" (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on spotted frogs and their habitat. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Other ongoing projects in the Easy riparian areas are discussed under Alternative 1, cumulative effects. Alternatives would not contribute to further degradation of riparian areas.

The road management activities associated with Alternative 5 is expected to contribute long-term benefits to the recovery of spotted frog habitat, more so than the No Action alternative, likely improving conditions beyond the pre-fire baseline.

Determination

In summary, Alternative 5 will **Not Impact (NI)** habitat, or impact individuals.

Existing Condition - Landbirds Including Neotropical Migratory Birds (NTMB)

Landbirds including neotropical migratory birds are species of concern in the Easy Project Area. Neotropical migratory birds breed in temperate North America and spend the winter primarily south of the United States-Mexico border. Of the 225 migratory birds that are known to occur in the western hemisphere, about 102 are known to breed in Oregon and about 82 are known to breed on the Malheur National Forest. They include a large group of species, including many raptors, cavity excavators, warblers and other songbirds, with diverse habitat needs spanning nearly all plant community types and successional stages. Long-term population data on many of these birds indicate downward population trends although not all species populations are declining (Saab and Rich 1997, Altman 2000, Sharp 1996). Habitat loss is considered the primary factor in decline of neotropical migratory birds.

In 2000, the Oregon-Washington Chapter of Partners in Flight published its Northern Rocky Mountains Bird Conservation Plan (Altman, 2000). The Plan provides conservation recommendations for the various species of landbirds that occupy the Oregon and Washington portions of the Interior Columbia Basin. The Plan identified the following priority habitats for landbird conservation: old-growth dry forest; old growth moist forest; riparian woodland and shrubland; and unique habitats including alpine and subalpine forests; shrub-steppe; montane meadow and aspen habitats. The Conservation Plan also identified burned old forest as a limited habitat due to fire suppression; the Easy Fire has obviously created a large amount of burn habitat that could provide for various landbird species. Many of the avian species/habitats identified in the Northern Rocky Mountains Bird Conservation Plan (Altman, 2000), are also addressed in the USFWS's Birds of Conservation Concern (USFWS, 2002).

Table TW-20 lists those priority habitats and associated focal species that would be expected in the project area. No alpine, subalpine forests, shrub-steppe, montane meadow and aspen types are associated with the area. The table identifies each focal species, their primary breeding habitat, and whether prescribed fire will positively or negatively affected them.

Table TW-20: Neotropical Migratory Birds – Focal Species found in the Project Area by Habitat Type Including Fire Effects and Resource which Identified Focal Species

Focal Species	Primary Breeding Habitat	Initial Easy Fire Effects to Species
Mesic Mixed Conifer (Late Successional)		
Vaux's swift	Large snags	Positive
Townsend's warbler	Overstory canopy closure	Negative
Varied thrush	Structurally diverse; multi-layered	Negative
MacGillivray's warbler	Dense shrub layer in forest openings or understory	Negative
Olive-sided flycatcher	Edges and openings created by fire	Positive
Dry Forest (ponderosa pine and dry mixed conifer)		
White-headed woodpecker	old growth - i.e., old forest single stratum (OFSS)	Negative/Positive
Flammulated owl	OFSS with interspersions grassy openings and dense thickets	Negative
Chipping sparrow	OFSS with regenerating pines	Negative/Positive
Lewis' woodpecker	Patches of burned OFSS or OFMS	Positive
Riparian Woodland and Shrublands		
Lewis' woodpecker	Large hardwood snags	Positive
Red-eyed vireo	Hardwoods - canopy foliage and structure	Negative
Veery	Hardwoods - Understory foliage and structure	Negative
Willow flycatcher	Hardwoods - Riparian shrub	Negative
Red-naped sapsucker	Aspen	Positive

Table TW-21. List of species of BCR 10, Northern Rockies Region, species status as present or absent from the Project Area, and how each species is addressed in this report.

Species	Presence /Absence	Reason for Absence/Where Addressed If Present
Swainson's Hawk	Absent	No Suitable Habitat
Ferruginous Hawk	Absent	No Suitable Habitat
Golden Eagle	Present	Habitat Not Affected by Proposed Activities
Peregrine Falcon	Absent	No Suitable Habitat
Prairie Falcon	Absent	No Suitable Habitat
Yellow Rail	Absent	No Suitable Habitat
American Golden-Plover	Absent	Outside Range
Snowy Plover	Absent	No Suitable Habitat
Mountain Plover	Absent	Outside Range
Solitary Sandpiper	Absent	Outside Range
Upland Sandpiper	Absent	No Suitable Habitat
Whimbrel	Absent	Outside Range
Long-Billed Curlew	Absent	No Suitable Habitat
Marbled Godwit	Absent	Outside Range
Sanderling	Absent	Outside Range
Wilson's Phalarope	Absent	No Suitable Habitat
Yellow-Billed Cuckoo	Absent	Outside Range
Flammulated Owl	Present	Landbird Discussion
Black Swift	Absent	Outside Range
Lewis' Woodpecker	Present	MIS - Primary Cavity Excavator Discussion
Williamson's Sapsucker	Present	MIS - Primary Cavity Excavator Discussion
Red-Naped Sapsucker	Present	MIS - Primary Cavity Excavator Discussion
White-Headed Woodpecker	Present	MIS - Primary Cavity Excavator Discussion
Loggerhead Shrike	Absent	No Suitable Habitat
Pygmy Nuthatch	Present	Landbird Discussion
Virginia's Warbler	Absent	Outside Range
Brewer's Sparrow	Absent	No Suitable Habitat
McCown's Longspur	Absent	Outside Range

Table TW-21 lists species identified in the USFWS's Birds of Conservation Concern (USFWS 2002), Bird Conservation Region (BCR) 10. BCR 10, the Northern Rockies Region, best characterizes the Easy Project Area. Effects on species listed in Table TW-21 will be analyzed in the context of changes in high priority habitats/focal species listed in Table TW-20.

Some neotropical migratory birds respond positively to fire, while others respond negatively in burned areas. However, generally, species richness and overall species abundance tends to decrease. The following sections summarize the effects of the Easy fire on the high priority habitats listed above. Discussion will only focus on those habitats that exist in the project area now or that existed prior to the fire.

Mesic Mixed Conifer

The mesic mixed conifer forest type refers to coniferous forest composed of cool moist Douglas-fir/Grand fir, cool dry Douglas fir, western larch, hemlock, and occasional ponderosa pine. This forest type accounts for approximately 18% (1,082 acres) in the Easy Fire area.

The Conservation Strategy (Altman, 2000) identifies five habitat components of the dry forest types that are important to landbirds:

- large snags (OFSS and OFMS)
- overstory canopy closure (OFSS and OFMS)
- structurally diverse; multi-layered (OFMS)
- dense shrub layer in forest openings or understory
- edges and openings created by fire

Due to past timber harvest and fire suppression, all old growth was classified as old forest multiple strata (OFMS) rather than old forest single stratum (OFSS). Prior to the fire, burned old forest was also lacking, as fire suppression had all but eliminated the influence of this disturbance factor in the project area. Bird species associated with Mesic Mixed Conifer forest have been adversely impacted primarily by the loss and reduction of late-seral conditions and structural elements such as snags (Altman, 2000).

The fire converted essentially all mature and old growth stands to early successional stages (see Old Growth Section). Dense understory thickets and regeneration patches burned extensively, although patches remain scattered throughout the area. Overstory nesting species and foliage or crown feeders have likely disappeared within the severely burned areas, and decreased in the moderate severity burn areas. Local species adversely affected may include the varied thrush, golden-crowned kinglet, mountain chickadee, hermit thrush, ruby-crowned kinglet, MacGillivray’s warbler, Townsend’s warbler, yellow-rumped warbler, and western tanager.

Flycatchers, ground feeders, and cavity nesters are expected to increase as a result of the fire. Local species that may benefit include the Lewis’ woodpecker, olive-side flycatcher, red-naped sapsucker, western-wood peewee, Hammond’s flycatcher, dusky flycatcher, dark-eyed junco, Cassin’s finch, mountain and western bluebirds, evening grosbeak, and American robin. The Primary Cavity Excavator Section describes woodpecker, sapsucker and flicker species in more detail; most of these species are expected to respond positively to the fire.

Dry Forests

The dry forest types refer to dry ponderosa pine dominated habitats and dry mixed conifer habitats (e.g., conifer stands of ponderosa pine, Douglas-fir, and/or grand fir). The majority (82% or, 4,757 acres) of the forest acres in the Easy area are classified as dry forest types.

The Conservation Strategy (Altman, 2000) identifies four habitat components of the dry forest types that are important to landbirds:

- large patches of old forest with large trees and snags (OFSS and OFMS)
- old forest with interspersion of grassy openings and dense thickets (OFSS and OFMS)
- open understory with regenerating pines (OFSS)
- patches of burned old forest

Pre-fire, 5,839 acres (100%) of the area was forested. Because of past timber harvest and fire suppression, all old growth was classified as old forest multiple strata (OFMS) rather than old forest single stratum (OFSS). Prior to the fire, burned old forest was also lacking, as fire suppression had all but eliminated the influence of this disturbance factor in the project area. Large-scale declines in OFSS have raised concern for such species as the white-headed woodpecker, flammulated owl, white-breasted nuthatch, pygmy nuthatch, Williamson's sapsucker, and Lewis' woodpecker. These bird species have likely suffered some of the greatest population declines and range retractions (Altman, 2000).

The fire converted essentially all mature and old growth stands to early or very early successional stages (see Old Growth Section). Dense understory thickets and regeneration patches burned extensively, although patches remain scattered throughout the area. Overstory nesting species and foliage or crown feeders, have likely disappeared within the severely burned areas, and decreased in the moderate severity burn areas. Local species adversely affected may include the pine siskin, golden-crowned kinglet, mountain chickadee, hermit thrush, ruby-crowned kinglet, yellow-rumped warbler, and western tanager.

Flycatchers, ground feeders, and cavity nesters are expected to increase as a result of the fire. Local species that may benefit include the Lewis' woodpecker, olive-side flycatcher, red-naped sapsucker, chipping sparrow, western-wood peewee, Hammond's flycatcher, dusky flycatcher, dark-eyed junco, Cassin's finch, mountain and western bluebirds, evening grosbeak, and American robin. The Primary Cavity Excavator Section describes woodpecker, sapsucker and flicker species in more detail; most of these species respond positively to the fire.

Riparian Woodlands and Shrublands

Riparian woodlands and shrub habitats are typified by the presence of hardwood tree and shrub species, along with associated wetland herbaceous species. Water is obviously an important component of these habitats, whether it is in the form of standing wetlands, spring and seeps, or flowing water (rivers and streams). Although these habitats generally comprise only a small portion of the landscape, they usually have a disproportionately high level of avian diversity and density when compared to surrounding upland habitats.

The Conservation Strategy (Altman, 2000) identifies three habitat components within the riparian woodlands and one within the riparian shrub habitats that are important to land birds.

- large snags, canopy foliage cover

- understory shrub cover
- dense shrub patches
- willow/alder shrub patches

Within the project area, riparian woodlands and shrublands are generally associated with Category 1 streams (2.26 miles) and Category 2 streams (2.87 miles). Priority hardwood habitats include willow, alder, and aspen; other hardwood species are present but at much lower levels. The riparian areas associated with the Category 1 and 2 streams are conifer dominated multi and single storied; with an understory of hardwood shrubs or grasses. Prior to the fire, many riparian areas were already deficient in hardwood trees and shrubs due to past and current management activities, including timber harvest, livestock grazing and fire suppression. Grazing by domestic livestock and browsing by deer and elk often inhibited hardwood regeneration.

Degraded riparian habitats have likely affected such landbird species as Lewis' woodpecker, red-naped sapsucker, downy woodpecker, red-eyed vireo, willow flycatcher, ash-throated flycatcher, tree swallow, house wren, swainson's thrush, calliope hummingbird, song sparrow, spotted towhee, western wood pewee, warbling vireo, American redstart, orange-crowned warbler, and mountain chickadee.

Fire severity in riparian areas was variable. Clear Creek, the only Category 1 stream within the fire perimeter, suffered only a partial burning. A few small spots, less than 1 acre, burned severely causing mortality in the overstory. For the most part, the vegetataion experienced a spotty underburn, removing some of the shrubs, forbs. and grasses. The grasses and forbs are revegetating well, shrubs are starting to regrow. Snag habitat is now more abundant.

Generally, the fire killed most of the trees in the riparian uplands. Approximately 25% of the RHCA's within the fire perimeter burned with moderate to high BAER Severity. The fire likely improved habitats for species that use riparian snags, such as the Lewis woodpecker and downy woodpecker. Initially, the fire likely reduced habitat for species such as the red-eyed vireo, veery and willow fly catcher; however, species are expected to recover rapidly as hardwood shrubs recover.

Environmental Consequences - Landbirds Including Neotropical Migratory Birds

Direct and Indirect Effects - Alternative 1

Mesic Mixed Conifer

The fire removed large expanses of forest, including nearly all the mature and old growth habitat. Bird species that are foliage or crown feeders and overstory nesting species, likely disappeared within the severely burned areas, but may still be using the moderate and low burn areas. Delays in reforestation under the No Action Alternative would delay recovery of forest canopy, with adverse effects to landbird species that feed and nest in forest canopies. The No Action Alternative removes no snags or downed logs. Habitat would be maximized for species that use post-fire conditions such as the olive flycatcher and the Lewis' woodpecker. (The Primary Cavity Excavator section describes effects to cavity excavators in detail.)

Dry Forests

The fire removed large expanses of forest, including nearly all the mature and old growth habitat. Bird species that are foliage or crown feeders and overstory nesting species, likely disappeared within the severely burned areas, but may still be using the moderate and low burn areas. Delays in reforestation under the No Action Alternative would delay recovery of forest canopy, with adverse effects to landbird species that feed and nest in forest canopies. The No Action Alternative removes no snags or downed logs. Habitat would be maximized for species that use post-fire conditions such as the olive flycatcher and the Lewis' woodpecker. (The Primary Cavity Excavator section describes effects to cavity excavators in detail).

Riparian Woodlands and Shrublands

The fire minorly reduced riparian vegetation in the Clear Creek RHCA; the fire killed little of the conifer overstory. Other creeks such as Easy Creek had 0.8mi of it's RHCA burn with high vegetation severity. Overall about 25% of the RHCA's in the fire area burned with moderate to high BAER Severity. Initially, landbirds associated with these habitats likely declined; however, effects are likely to be short-lived. The expected flush of ground vegetation, particularly shrub species, may elevate the amount and distribution of riparian hardwoods to levels higher than existed prior to the fire. Grasses and forbs are expected to reestablish naturally in 2 to 5 years; shrubs are expected to reestablish in 2 to 15 years. Population numbers for grass and shrub nesting neotropical migratory birds is expected to remain stable or increase due to recovery of ground vegetation, both inside and outside riparian areas. Species such as the willow flycatcher, red-eyed vireo and western meadowlark, would likely respond positively.

This alternative will not plant riparian vegetation in any RHCA. Natural regeneration will be relied on to revegetate the RHCA's, potentially slowing the development riparian vegetation. Natural revegetation is occuring even in the severally burned RHCA's, with shrubs and forbs showing the most recovery, conifers and hardwoods appear to be taking slightly longer.

Direct and Indirect Effects - Alternatives 2, 3, 4, and 5

Salvage logging is known to further reduce species richness in burn areas. Raphael & White (1984) reported that in their studies species richness declined only in the most severely salvaged burns, although even partial salvaging altered species composition.

Salvage logging between May and August, the primary nesting season, would present the highest risk to any neotropical migratory birds nesting in the area. Some individual birds could be directly affected, but this should not be a significant number and should not affect populations or viability.

The risk of an intense reburn is highest with Alternative 4. Although risks do not increase for 10 to 20 years which is the amount of time expected for snags to fall to the ground and elevate fuel loads. Another stand replacement fire would delay recovery of vegetation.

Mesic Mixed Conifer

At a minimum, it is expected that removal of snags would have a negative effect on population numbers of cavity nesting landbirds including neotropical migratory species (see Primary Cavity Excavator Species section). Direct effects would primarily be displacement from nests by removal or destruction of nest structures (snags, ground nests) during salvage operations. Alternatives 2, 3, and 4 propose timber salvage on 1,777 acres (30% of forested acres), 1,298 acres (22% of forested acres), and 956 acres (16% of forested acres) respectively. Alternative 2 retains 2.4 snags per acre left in patches of 2 – 6 acres in size throughout the harvest units. Alternative 3 would have less impact; fewer acres would be treated. However, the only snags retained in the harvest units will be a number sufficient to meet the Forest Plan standards for down wood. Large patches of snags (1,524 acres total) would be retained to provide large snag patches for those species that select for higher concentrations of snags, such as the black-backed woodpecker. Alternative 4 would have the least impact. Large diameter snags are retained on all harvest acres, 13 snags per acre, left in 2 – 6 acre patches. This number of snags left throughout the harvest units results in higher fuel loadings and in the event of a reburn would cause the fire severity to be highest; next to the No Action Alternative.

Alternatives 2, 3 and 4 would accelerate reforestation of the project area through planting conifers. Reforestation would reestablish trees in the burn area within 5 years. Many neotropical migratory species require high tree canopy closure levels for nesting and foraging, and it will likely take at least 30 to 50 years before overstory canopies are restored to levels that even remotely mimic pre-fire conditions. Habitat for species which require mature or old growth conditions may take 75 to 150 years to develop (see old growth discussion).

Alternative 5 proposes no salvage harvest, but removes snags <7”dbh to reduce fuel loadings. This alternative also plants the severely burned acres, speeding the reforestation process. This alternative produces minimal negative impacts compared to Alternatives 2-4 by removing only small diameter snags, which should decrease the risk of a reburn. The young stands that will result from reforestation will provide habitat for those landbirds that rely on younger aged forests. While most of the focal species prefer older forests with more complex structure.

Dry Forests

At a minimum, it is expected that removal of snags would have a negative effect on population numbers of cavity nesting landbirds including neotropical migratory species (see Primary Cavity Excavator Species section). Direct effects would primarily be displacement from nests by removal or destruction of nest structures (snags, ground nests) during salvage operations.

The greatest number of acres would be treated under Alternative 2 (3,652 acres, 62%) with snags being retained at 2.4/acre, the level required by the Forest Plan for 100% potential population. Alternative 3 would have less impact; fewer acres would be treated. However, only enough snags will be retained within the harvest units to provide the down wood levels required under the Forest Plan. Alternative 4 should have the least impact, snags would be retained in 2-6 acre patches to provide 13 snags per acre for the entire unit.

Alternatives 2, 3 and 4 would accelerate reforestation of the project area through planting conifers. Reforestation would reestablish trees in the burn area within 5 years. Many neotropical migratory species require high tree canopy levels for nesting and foraging, and it will likely take at least 30 to 50 years before overstory canopies are restored to levels that even remotely mimic pre-fire conditions. Habitat for species which require mature or old growth conditions may take 75 to 150 years to develop (see old growth discussion).

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Riparian Woodlands and Shrublands

In riparian areas, no salvage logging or fuels reduction activities are proposed under any of these alternatives. Where open roads are located in riparian areas, hazard trees may be felled and left in place. Proposed road closures and road decommissioning in riparian habitat conservation areas (RHCAs) would likely benefit landbird species by reducing disturbance and possibly restoring habitats. Planting of conifers and shrub species would occur in burned riparian areas speeding up the recovery of vegetation in the areas. Direct effects to riparian landbirds, including neotropical migratory species, are likely to be at least minimally positive. Indirectly, riparian landbirds may experience increases in population levels as a result of the fire. Population numbers for grass and shrub nesting species is expected to remain stable or increase due to recovery of grass, forbs and shrub vegetation as described in the No Action section.

Cumulative Effects - All Alternatives

All of the activities listed in "Past, Present, and Reasonably Foreseeable Actions" (see beginning of Chapter 3, FEIS) have been considered for their cumulative effects on neotropical migratory birds and their habitat. The following discussion focuses on those past, ongoing and reasonable foreseeable future activities that may contribute negative or positive effects.

Habitat loss is considered the primary factor in decline of neotropical migratory birds. Previous sections identified high priority habitats for conservation of neotropical migratory birds: old-growth dry mesic conifer forest types including burned habitats, and riparian woodland/shrubland.

Cumulative effects on mature and old growth coniferous forest are discussed above in the Old Growth section, and conclude that the Alternatives 2,3,4 and 5 would have varying positive effects for mature and old growth habitat and for the species that use those habitats.

Cumulative effects to snag and related post-fire habitat were discussed in the Primary Cavity Excavator Species section. Snag habitat would be reduced under alternatives 2, 3, and 4.

Riparian vegetation within and adjacent to the Easy Fire area has been altered by many years of livestock grazing, primarily earlier in this century, that concentrated use in riparian areas; by suppressing historical fire regimes that allowed encroachment of conifers which shaded out hardwoods, and by timber harvest. The condition of some riparian areas has been improved by new management practices and restoration activities in more recent years, but may not be fully restored to conditions that are most suitable for associated native wildlife species.

Neither the Alternative 1 nor Alternatives 2-5 would contribute to further degradation of riparian vegetation because no salvage activity would be conducted in RHCAs. Projects are being planned simultaneously to plant riparian areas with hardwood and conifer species. Livestock grazing has been discontinued in the burn area until ground vegetation recovers. Cumulatively, these actions will help reestablish riparian vegetation to the benefit of neotropical migratory birds.

Future projects considered in the cumulative effects analysis would have to abide by direction to maintain or enhance mature and old growth habitat, to protect or enhance riparian areas, grassland and woodland communities, and should consider potential direct effects to neotropical migratory birds; therefore, they are not expected to contribute to cumulative effects.

Summary of Landbirds Including Neotropical Migratory Birds

The primary effect of alternatives 2,3, and 4 would be to reduce snag habitats. The Primary Cavity Excavator section summarizes effects to landbirds that use these habitats. These alternatives propose few to no activities within riparian woodland and shrubland habitats considered a high priority for landbird conservation. Therefore, all other adverse affects to landbird species, including neotropical migratory species, would be considered minimal.

Alternatives would not be expected to reduce viability of any landbird species including neotropical migratory species. The primary effect of these alternatives would be to reduce snag habitats; the Primary Cavity Excavator section summarizes effects to landbirds that use these habitats. Alternatives 2-5 propose few to no activities within riparian woodland or shrubland habitats considered a high priority for landbird conservation.

By planting trees, Alternatives 2-5 would accelerate recovery of vegetation; in severely burned areas, regeneration of conifer trees could take 10 to 40 years less than under the No Action Alternative.

Under Alternatives 1 and 4, the elevated fuel loads expected in 10 to 20 years increase the risk of an intense re-burn. Another stand replacement fire could further delay development of forest vegetation. Alternatives 2 and 3 also leave some burn areas untreated, but salvage logging and fuels reductions reduce overall fuel loads and break up the continuity of fuels remaining. Alternative 5 does no salvage logging, but proposes fuel reduction activities which will reduce fuel loadings and continuity.

Consistency with Direction and Regulations

The Malheur National Forest Plan objective for old growth is to provide suitable habitat for old growth dependent wildlife species, ecosystem diversity and preservation of aesthetic qualities. Regional Forester’s Forest Plan Amendment #2 provided additional direction to protect existing late and old structure (LOS) stands and to manipulate vegetation that currently does not classify as LOS towards LOS. None of the alternatives will reduce old growth habitat remaining after the fires. Only incidental live trees will be cut; trees that would interfere with skyline corridors, helicopter landings, pose a hazard to operations, etc.. Natural regeneration and planting are expected to re-vegetate forest although at different rates. Planting accelerates recovery of vegetation and development of old growth. Although changes in MA-13 old growth and MA-1 General Forest designations will require a nonsignificant Forest Plan amendment, these changes remain consistent with the Forest Plan.

The Malheur National Forest Plan requires that 20% of summer range be maintained as marginal and satisfactory cover. In spite of the Easy Fire, the Clear Creek subwatershed (38% cover), Reynolds Creek subwatershed (49% cover), and Bridge Creek subwatershed (55%) cover continue to meet this standard. None of the alternatives further reduce marginal and satisfactory habitat. The Clear Creek, and Bridge Creek subwatersheds do not meet Forest Plan standards for open road density. Alternatives 2,3,4 and 5 close additional roads within the burn areas. No additional road closures were identified within the Bridge Creek subwatershed with this project, only a small portion of the subwatershed is within the project area. Following road closures the Clear Creek subwatershed would be moved towards the standard. In future environmental analyses, additional road closures would likely be considered in the unburned portions of the subwatersheds. Planting accelerates recovery of vegetation and development of hiding and thermal cover.

All alternatives, except alternative 3, would meet or exceed Forest Plan snag standards, (e.g., 2.39 snags per acre, 21 inches DBH or greater). Large down logs do not meet Forest Plan standards as a result of the fire, at least in the severely- and moderately-burned areas. In the Alternative 2, 3, and 4, mitigation has been incorporated to retain all existing down logs required to meet the standards. As snags begin to fall, down log levels would increase thereby increasing denning, nesting, and feeding habitat for down wood dependent species. By year 15 post-fire, all alternatives are expected to meet the minimum Forest Plan standard.

Under Alternative 3, snag distribution would not be calculated on a 40-acre basis in patches of 2-6 acres as required by the Forest Plan, requiring a nonsignificant Forest Plan amendment. Instead, snags in salvage units would be retained individually or in small patches. Studies show that cavity dependent species select nest sites with higher tree densities and cavity nesters as a group prefer patches of snags as opposed to single snags retained in uniform, even spaced distribution (Rose et al., 2001; Saab et. al, 2002; Kotliar, 2002).

Under alternatives 2, 3, 4, and 5, Dedicated and Replacement Old Growth 364 will be relocated outside the fire perimeter. The DOG and ROG burned with moderate to severe mortality of trees; few live trees remain. No other OFMS or OFSS survived the fire in sufficient amounts to comprise a new DOG and ROG within the fire perimeter. The new locations provide better opportunities to manage for old growth given the level of fire damage in the original location. Acres in the new DOG/ROGs would be converted from general forest (MA-1) to Dedicated Old Growth (MA-13). Conversely, existing DOG/ROG 364 within the fire perimeter would be converted from MA-13 to MA-1. A nonsignificant Forest Plan amendment would be required to relocate DOG/ROG 364 and change Management Area (MA) designations.

For northern goshawks, all alternatives are consistent with the Forest Plan and the Regional Forester's Eastside Forest Plans Amendment #2. Alternatives 2, 3, and 4 do not propose harvest of snags within the PFA in the fire area. Natural regeneration and planting are expected to re-vegetate forest although at different rates. Planting accelerates recovery of vegetation and development of nesting habitat. Mature and old growth stands suitable for nesting, as well as the existing nest sites, would be monitored annually for nesting activity.

All alternatives are consistent with the 1918 Migratory Bird Treaty Act (MBTA) and the Migratory Bird Executive Order 13186. Alternatives were designed under current Forest Service policy for landbirds. The Northern Rocky Mountains Bird Conservation Plan (Altman 2000) and the U.S. Fish and Wildlife Service's Birds of Conservation Concern (USFWS 2002) were reviewed for effects disclosure. Salvage logging and other vegetation management cannot completely avoid unintentional take of birds, no matter what mitigations are imposed on the activities. Mitigation, such as retention of snags and down logs, retention of live trees, and avoidance of riparian areas, proposed in this project will minimize take of migratory birds.

All alternatives are consistent with the Endangered Species Act (see Appendix D, Wildlife Biological Evaluation). Alternatives are expected to have **No Effect** on threatened and endangered species (see Appendix D, Wildlife BE). Alternatives are expected to have a **No Impact** to all sensitive species except the Columbia spotted frog. In the case of the Columbia spotted frog Alternatives 2, 3 and 4 **may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species**. Based on these effects calls, consultation with the US Fish and Wildlife Service was not considered necessary; even so, the U.S. Fish and Wildlife Service has been kept informed of the Easy Fire Recovery Project.

Forest Plan Amendments

Dedicated Old Growth

Alternatives 2, 3, 4, and 5 would require a nonsignificant Malheur Forest Plan Amendment to make the proposed changes to dedicated old growth and replacement old growth habitat. This is considered a nonsignificant amendment to the Malheur Forest Plan due the following factors (see Forest Service Handbook 1909.12): Timing; location and size; goals, objectives, and outputs; and management prescriptions.

Timing - The proposed change is taking place after the first decade of the current 1990 plan; but will be enacted before the next schedule revision. The next scheduled revision of the Malheur Forest is to begin in 2004 with an anticipated completion date of 2008. Therefore, the timing of this amendment is nonsignificant because of how late this change is occurring under current Forest Plan direction.

Location and Size – This amendment would change the designation of DOG/ROG 364 from MA-13 – Old Growth to MA-1 – General Forest; and designate a new DOG and ROG outside the project area, changing them from MA-1 to MA-13. The new DOG will be the same acreage as the former DOG. The new ROG will be 310 acres larger than the former ROG. The re-delineation of old growth and replacement old growth to other areas would be located in the closest available LOS stand outside the Easy fire area.

Goals, Objectives, Outputs, and Management Prescriptions - The Easy Fire affected the function and character of two dedicated old growth habitats and one replacement old growth habitat within the fire perimeter. Dedicated old growth impacted by fire no longer provides habitat conditions to meet pileated woodpecker and pine marten habitat requirements. The associated replacement old growth also no longer functions as suitable habitat for those species. Alternatives 2, 3, 4, and 5 propose the re-delineation of the dedicated old growth and replacement old growth habitats such that they include habitat features and conditions suitable to the pileated woodpecker and the pine marten and meet Forest Plan direction. The new

ROG 364 is larger than the old ROG 364 so that it can provide a connection between the connectivity corridor that follows Clear Creek and went through the center of the fire area and the corridor to the west of the fire. This will allow for wildlife movement around the fire area.

Snag Distribution

Alternative 3 would require a nonsignificant Malheur Forest Plan Amendment to modify the snag distribution; from the requirement in Amendment B of the Malheur Forest Plan to 2 or less snags per acre in harvest units, not clumped in 2-6 acre patches, determined on an acre basis. Alternative 3, in general, provides better habitat for black-backed and three-toed woodpeckers due to the high densities of snags remaining. The designated snag retention areas provide the high densities of snags in large patches that these species need (Saab and Dudley, 1997; Hutto, 1995; Sallabanks, 1995) as compared to what the Forest Plan standard for snag distribution would provide. These species can also utilize a burned area sooner than others because of their ability to utilize hard snags. This is considered a nonsignificant amendment to the Malheur Forest Plan due the following factors (see Forest Service Handbook 1909.12): Timing; location and size; goals, objectives, and outputs; and management prescriptions.

Timing - The proposed change is taking place after the first decade of the current 1990 plan; but will be enacted before the next schedule revision. The next scheduled revision of the Malheur Forest is to begin in 2004 with an anticipated completion date of 2008. Therefore, the timing of this amendment is nonsignificant because of how late this change is occurring under current Forest Plan direction.

Location and Size – This proposed change applies only to harvest units in Alternative 3 which total 1,298 acres (22%) of the planning area.

Goals, Objectives, Outputs, and Management Prescriptions – The proposed change applies only to harvest units associated with this project for the duration of this project. The Desired Future Condition is not affected by the modification of snag distribution will still provide habitat for primary cavity nesters, with better habitat conditions for some. Woodpeckers such as the three-toed, and black-backed require high densities of snags. The delineated snag patches will provide these high densities.

Irreversible/ Irretrievable Commitments of Resources

The loss of snags would be an irretrievable loss until replacements function as snags There are no other irreversible or irretrievable commitments of resources associated with wildlife or wildlife habitat that may result from the implementation of alternatives.